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ABSTRACT

This document reports the development of an instructional design model for facilitating students' higher order thinking in vocational education programs. It is intended to help those who establish training requirements, identify training problems, diagnose student learning needs, develop training programs, and evaluate program effectiveness. The development process described is considered replicable in other vocational knowledge domains. The first chapter introduces the research project that produced the document and discusses the significance of developing the design model. Chapter 2 outlines the research underlying knowledge domain development. Chapter 3 describes domain structure and development, including: identification of a goal action structure; development of a task environment structure; and identification of domain-relevant thinking processes. Chapter 4 reports the development and validation of appropriate instructional materials. Among the eight appendices are a list of: the main goals for a goal action structure on supporting children's social development; the subgoals associated with each main goal; recommended actions for each goal and subgoal; a list contrasting actions that foster control of students with those that support students; and rules for establishing priorities among competing goals. (A 70-item bibliography is included). (CML)

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INSTRUCTIONAL DESIGN FOR DEVELOPING HIGHER ORDER THINKING

VOLUME I: KNOWLEDGE DOMAIN DEVELOPMENT

BY

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JULY 1989



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ABSTRACT

This volume is one of two that report the development of an instructional design model relevant to facilitating students' higher order thinking in vocational education programs. Volume I reports development of the knowledge domain portion of a prototype instructional design developed from the model and describes concepts central to knowledge domains as viewed in the model. Volume II describes the instructional design model and the prototype instructional design developed and tested in this project. This approach to instructional design focuses on facilitating higher order thinking in relation to specific domains of knowledge and practice. A theory of a specific knowledge domain including its structure, content and functions was developed as a part of this project. Instructional materials reflecting the domain were also developed and evaluated as part of the project. The knowledge domain theory and related instructional materials are anticipated to be useful in training programs for establishment of training requirements, identification of training problems, diagnosing student learning needs, development of training programs and evaluating the effectiveness of training programs. The knowledge domain is a prototype that can aid further applications of the theory developed in this project by serving as an example of a type of knowledge domain. To this end, the process of domain development described in this report should be replicable in other vocational education knowledge domains.

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CHAPTER 1

INTRODUCTION, PROBLEM, SIGNIFICANCE, PURPOSES AND BACKGROUND

Introduction: Higher Order Thinking Research Program

The research reported in this monograph was conducted as part of the Higher Order Thinking Research Program at the Minnesota Research and Development Center for Vocational Education located at the University of Minnesota. The purposes of this program of research are to conduct research on:

- the nature of problems requiring higher order thinking that are of concern in vocational education
- the nature of mental processes and structures that underlie expertise in specific knowledge domains related to work or family roles and contexts
- instructional design for developing, facilitating and improving mental processes and structures associated with specific knowledge domain expertise
- assessment of mental processes and structures underlying expertise in specific knowledge domains related to work or family roles and contexts

It is intended that this research will result in improved understanding of the nature of problems and expertise in areas relevant to vocational education and better ways of developing and assessing that expertise. This monograph reports results of research focused on the third purpose: Instructional design for developing, facilitating and improving mental processes and structures associated with specific knowledge domain expertise related to work or family roles and contexts.

The focus of the research in the Higher Order Thinking Research Program is on understanding, developing and assessing mental processes and structures underlying expertise in specific knowledge domains. A specific knowledge domain is what one needs to know in order to successfully practice in a particular profession, trade or role. A specific knowledge domain is acquired by education,

training and experience which exposes the individual to the concepts, principles, processes and phenomena in a domain of knowledge or practice.

Mental processes include the processing of information as it is influenced by perception and individual dispositions. Mental structures include the forms, organization, arrangements and systems in which knowledge exists in the human mind. Expertise refers to the possession of a high level of skill or proficiency in identifying and solving problems, resolving situations or performing certain functions. As it is used here, it also refers to the production of particularly creative, interesting or insightful thought, and the noting of especially subtle nuances. Expertise is demonstrated by depth and breadth of comprehension and interpretation, and by the quality of conclusions, evaluations and judgments. A more complete discussion of terms and concepts central to this research program can be reviewed in Thomas and Litowitz (1986).

The Higher Order Thinking Research Program has been funded since 1985 by the Minnesota State Board for Vocational Education. In the first year of the program, an agenda for inquiry investigating higher order thinking in relation to vocational education was produced (Thomas & Litowitz, 1986). Two studies responding to the portion of the inquiry agenda calling for research that contributes to understanding of the nature of mental processes and structures were completed during the Higher Order Thinking Research Program's second year. These two studies, reported in a previous monograph (Cooke, 1988; Johnson, 1988; Thomas, 1988a), examined relationships between knowledge and mental processes and the ability to solve problems by focusing on the question, "What knowledge and mental processes guide, organize and form effective actions in working with specific knowledge domain problems?"

The Tailored Response Test (TRT) Project reported in a previous monograph (Thomas, 1988b) was completed in the third year of the research program. The TRT Project addressed the need for tools to assess thinking processes and mental structures underlying expertise in specific knowledge domains related to work contexts.

This monograph reports research completed in the fourth year of the research program. This phase of the research focused on instructional design for developing thinking processes and knowledge structures underlying expertise.

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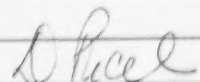
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Problem, Purpose and Background

Problem and Significance

The problem toward which this research project was directed is the design of instruction in vocational education that facilitates higher order thinking. Instruction that results in higher order thinking capabilities in vocational education learners has been identified as a key outcome for vocational education programs in Minnesota and as a research priority (Minnesota Research and Development Review Committee for Vocational Education, 1985, 1986, 1987). Further, the Minnesota State Board of Education (1988) has supported work readiness as a priority for Minnesota students and endorsed recommendations of the Task Force on Education for Employment that include thinking and problem solving as significant work readiness-related educational outcomes for Minnesota students (Education Update, 1988).

While a great deal of research in cognitive science has been directed toward understanding thinking processes, until very recently, less has been devoted to instructional design (Frederiksen, 1984). The instruction-focused research that has been done has concentrated on areas of education other than vocational education. Consequently, vocational educators have few models directly focused on their areas of study that enable them to incorporate new knowledge about thinking processes in their teaching.

Purpose

The purpose of this project was to develop an instructional design model for vocational education which can be used to generate instructional designs that enhance the higher order thinking capabilities of vocational education learners.

The objectives of the research were to:

1. Develop an instructional design model for teaching thinking processes and knowledge structures related to areas of expertise which vocational education programs seek to develop in learners.
2. Test the instructional design model by developing a prototype instructional design for teaching thinking processes and knowledge structures related to expertise in an area of vocational education.
3. Develop instructional materials for the prototype instructional design.

4. Test the prototype instructional design for effectiveness in developing thinking processes and knowledge structures relevant to the selected area of expertise.

Background

Definitions of Higher Order Thinking

Higher order thinking is defined as complex levels of intellectual functioning involving mental processes that demand more than simply taking in and storing discrete bits of information (Thomas & Litowitz, 1986). Laster (1985) defined higher order thinking as purposefully processing information beyond superficially memorizing or recalling it. Higher order thinking has been further defined as any cognitive mode of developing connections or anticipating outcomes (Messick, 1984). These definitions point to key attributes of higher order thinking: (a) it is purposeful; (b) it requires and generates connections between parts of one's stored knowledge; and (c) at its most fully developed levels, it is concerned with anticipating states, conditions and events and determining their meanings and implications.

Several perspectives are evident in the research literature regarding higher order thinking. These perspectives include problem solving, goal-directed action, and critical thinking. Each has a somewhat different orientation since their roots are in different bodies of knowledge: cognitive psychology, social psychology and philosophy. Quellmalz (1985, p. 30) describes his definition of higher order thinking as an attempt to merge the psychology and philosophy perspectives: Students engage in purposeful, extended lines of thought during which they (a) identify the task or problem types, (b) define and clarify essential elements and terms, (c) judge and connect relevant information, and (d) evaluate the adequacy of information and procedures for drawing conclusions and/or solving problems. In addition, students engage in metacognition which involves becoming critical of the strategies they use, becoming self-conscious about their thinking, and developing self-monitoring, problem solving strategies. Quellmalz identifies analyzing, comparing, inferring, interpreting and evaluating as commonly specified higher-order reasoning processes and planning, monitoring, reviewing and revising as central metacognitive processes.

Sternberg (Quinby, 1985) identifies three processes associated with thinking: (a) executive processes or metacomponents focused on planning what you're doing, monitoring while you're doing it, and evaluating after it's done (equivalent to Quellmalz's metacognitive components); (b) performance processes including actually doing what the

executive processes tell you to do; and (c) knowledge acquisition or learning components which involve learning how to do the problem solving.

Further and more detailed discussion of the nature and types of several types of higher order thinking, including comprehension, problem solving, critical thinking, practical reasoning and related concepts including intelligence, competence and creativity, can be found in the inquiry agenda publication (Thomas & Litowitz, 1986).

Requirements, Prerequisites for Higher Order Thinking

Instructional design intended to facilitate learners' higher order thinking capacities must address the capacities and attributes upon which higher order thinking rests. Higher order thinking draws on both internal mental resources and on information in the external environment. Individuals must possess the internal mental resources that enable higher order thinking and be able to perceive and interpret information in the external environment and integrate it with knowledge they have stored in their memory.

Earlier in the cognitive science research movement, it was believed that it would be possible to teach generic higher order thinking processes that would be applicable to any problem or situation. Courses on thinking skills were developed in some schools as a new aspect of the school curriculum. After some experience with such courses and as more research has explored the question of generic thinking processes, it has become increasingly evident that there is an intimate relationship between thinking processes and a well-developed knowledge base (J. R. Anderson, 1987; Bransford, Sherwood, Vye, & Rieser, 1986; Sherwood, Kinzer, Bransford, & Franks, 1987; Spiro, Coulson, Feltoovich, & Anderson, 1988; Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987). Further, it is the combination of this well-developed knowledge base and well-developed thinking processes that supports high levels of competence in particular areas of practice.

A knowledge base in a particular area is referred to in the cognitive science research literature as domain knowledge. Domain knowledge is

...the declarative, procedural, or conditional knowledge one possesses relative to a particular field of study. Declarative knowledge refers to factual information (knowing what), whereas procedural knowledge...includes functional units that incorporate domain-specific strategies (knowing how). Conditional knowledge entails the

understanding of when and where to access certain facts or employ particular procedures. (Alexander & Judy, 1988, p. 376)

Proceduralization is a term given to the integration of declarative, procedural and conditional knowledge. Proceduralization is a knowledge structuring process whereby the factual knowledge one knows becomes embedded within actions which become associated with conditions (Cooke, 1988). People who demonstrate high levels of competence in their thoughts and actions have a well-developed, domain-specific, proceduralized knowledge structure. Their knowledge is structured in such a way that efficient paths are present between the knowledge and high level, complex thinking processes.

Declarative (factual) knowledge, procedural (action) knowledge, conditional (when and where) knowledge and the thinking processes that interact with these types of knowledge comprise a system of interacting parts. When parts are lacking, it is evident in diminished competence. For example, beginning learners often possess declarative knowledge but lack procedural or conditional knowledge. Thus, they do not act on their knowledge and may refer to facts, concepts or principles that are irrelevant or inappropriate in relation to the problem or situation at hand. As it is typically done, the teaching of only facts, concepts, principles and theories in a knowledge domain does not produce the kind of knowledge structure that will render those facts, concepts, principles and theories usable by learners in problems and situations where that knowledge is applicable. A usable knowledge structure is one where facts, principles and theories are linked to problems, goals and actions.

Thinking Processes of Concern in Vocational Education

Vocational educators are concerned with the integration of knowledge and thinking in relation to practice. Practice refers to performance in a range of knowledge domain-related situations, some of which are similar recurrences of the same type of situation and some of which are new, unfamiliar occurrences. Practice involves resolving situations or problems (Schon, 1983). Vocational education is concerned with "thought...in the service of action" (Rogoff, 1984, p. 6). This kind of thinking is "embedded in larger activities and...functions to carry out the goals of those activities" (Scribner, 1984, p. 9). Goals may involve mental, manual (Scribner, 1984, p. 9) or social accomplishments. In work contexts and situations, thinking processes are related to action in ways that facilitate mental reconstruction of stored knowledge and operations

involved in the accomplishment of a task. One function of such thinking is to organize the operational components of tasks and make them more economical (Scribner, 1984, p. 16). Another function is to make actions appropriate to the goals of tasks and to the priorities related to tasks.

The focus on practice in vocational education is both its strength and its challenge. Vocational education is concerned not simply with understanding but also with the application of understandings in particular contexts, problems or situations. This context and situation-dependent use of knowledge makes declarative knowledge of facts necessary but insufficient for vocational education. Proceduralized, conditional, "how, when and where" knowledge is also needed.

The greater the number of factors that must be considered and the greater the range of variation in conditions, situations and problems, the more complex the knowledge and thinking processes required to deal with specific situations and problems will be. In the course of learning and practicing a craft, trade, occupation or role, the practitioner repeatedly encounters certain types of situations, some having small variations from others of the same type. Over time, practitioners develop repertoires of expectations, images and techniques. Practitioners learn what to look for and how to respond to what they find. When the types of situations encountered are relatively stable and predictable, and when many situations have been experienced, a degree of automatic functioning that does not involve higher order thinking becomes possible (Schon, 1983; Sternberg, 1985). Thus, when work contexts are stable, involving only small scale and infrequent change, education for practice can be less concerned with higher order thinking because individuals can be taught more comprehensively what they need to know to function competently. However, when there is large scale and rapid change in work or family contexts, the character of problems and situations changes dramatically and frequently. Such contexts require practitioners to adjust their actions in order to meet the demands of unique, diverse and new types of situations (Rogoff, 1984). Such adjustments require higher order thinking involving complex judgment processes and the ability to acquire relevant information. Education that prepares people for practice in rapidly and dramatically changing work or family contexts must include the development of higher order thinking processes and broader concepts of types of problems and situations. This project addressed that need.

CHAPTER 2

RESEARCH UNDERLYING KNOWLEDGE DOMAIN DEVELOPMENT

Research Methodologies

The problem of devising an instructional design model for facilitating higher order thinking in vocational education was addressed in this project using approaches suggested in the research literature (Abelson & Black, 1986; Champagne, Klopfer, & Gunstone, 1982; Ennis, 1989). These approaches involve conducting studies of specific knowledge domains and their use in and relation to thinking processes at varying levels of expertise. Volume I focuses on the knowledge domain portion of the instructional design model. Volume II focuses on the instructional processes portion of the instructional design model.

This chapter reviews the nature of the research that underlies the knowledge domain portion of the instructional design model. The purpose of this chapter is to describe the research that underlies this new approach to instructional design and to show how that research fits into the instructional design model. Figure 1 provides a graphic summary depicting the progression from research to instructional design.

Research underlying knowledge domain development seeks to discover and understand the mental processes and structures that guide actions of practitioners engaged in problem solving and situation resolution or improvement. Its purpose is to understand the thinking processes and knowledge structures which enable practitioners to act competently, appropriately and insightfully to solve problems or resolve or improve situations (Schon, 1983; Thomas, 1988a; Thomas & Litowitz, 1986). Teachers who are highly competent practitioners in a domain can readily demonstrate competent performance and, thus, provide learners with a performance model or standard. This model contributes to, but is not sufficient for, helping learners develop high levels of competence because it does not reveal the critical sources (i.e., the thinking processes and knowledge structures) of expert performance (Schon, 1983). Unfortunately, it is difficult for teachers to analyze their own performance to reveal the thinking processes and knowledge structures that guide it. This is because these intellectual processes and resources are often not available to retrospective conscious thought. This is especially true for persons who have achieved a high level of expertise because much of what makes one an expert has by that

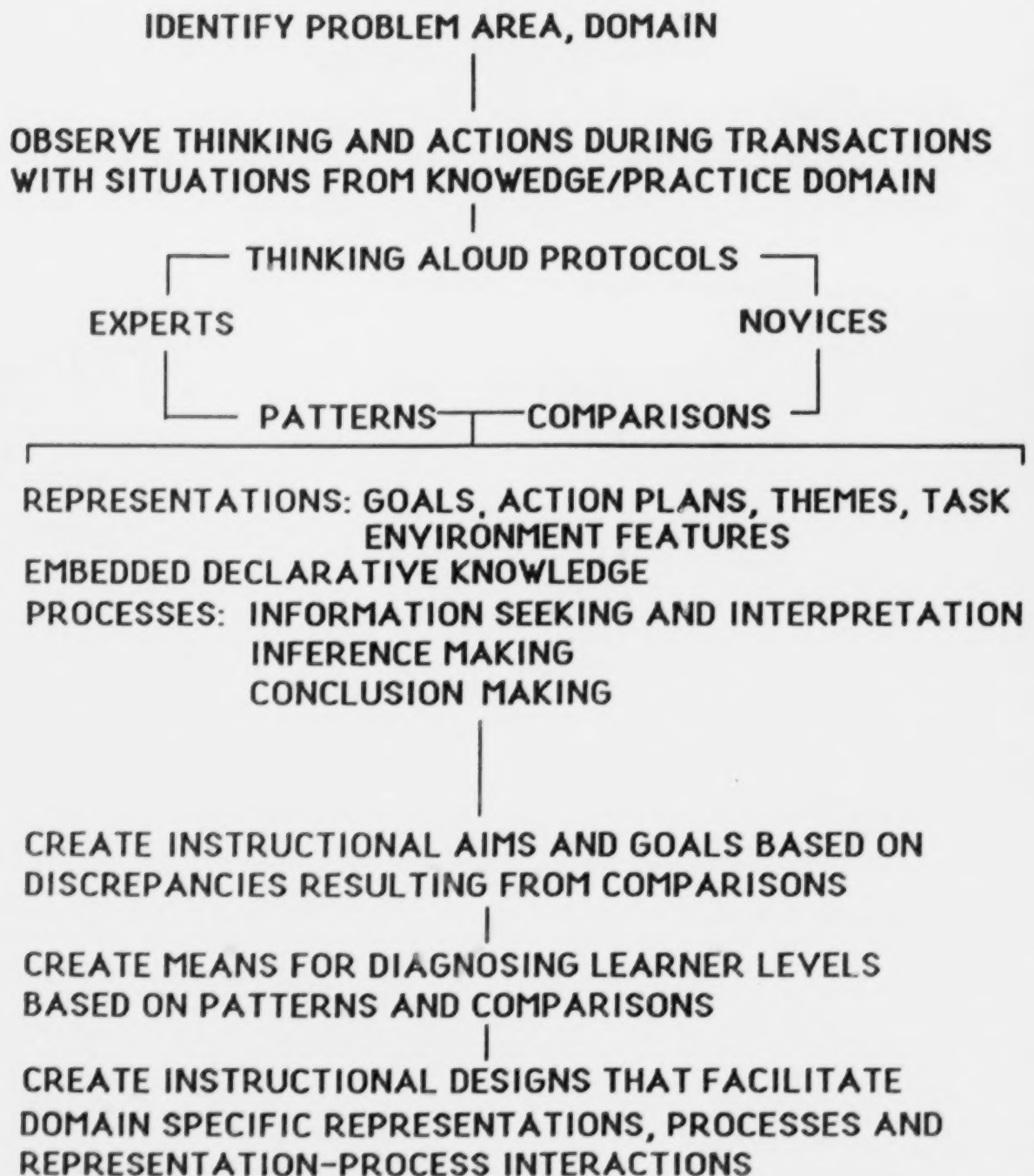


Figure 1. Progression from research to instructional design.

time become automatic and unconscious (Sternberg, 1985). The research conducted in the Higher Order Thinking Research Program is designed to reveal these evasive mental processes and resources with the intent of using that information in creating instructional design models and prototypes that facilitate higher order thinking.

Three research methodologies have been used to study the mental processes and resources that underlie competent practice. The first is thinking aloud protocol methodology (Ericsson & Simon, 1984). This methodology asks individuals at varying levels of expertise to verbally express their thinking while engaging in problem solving or other types of activity. A tape recorder or video camera is used to record each person's verbal expression of their thinking and their actions. Actions are also recorded by an observer. The data that are collected represent unedited, stream of consciousness thinking. The recorded protocol is then transcribed and segmented at breath or pause points (which represent the end of thought units according to Ericsson & Simon, 1984). Data analysis involves coding the segments according to concepts and variables that will reveal practitioners' thinking process patterns and knowledge structures.

The second research methodology is stimulated recall (Calderhead, 1981). In this method, individuals are video taped while they engage in problem solving or in resolving situations. Then, immediately following the episode, the video tape is replayed and the individuals observe themselves. The tape is stopped at frequent intervals either on the subject's or the investigators' initiative, and the individuals are asked to tell what they were thinking during the just-viewed segment.

The third methodology, situation analysis (Thomas, 1988; Thornton, 1988), involves asking people at varying levels of expertise to view video-taped situations and to indicate which practitioner actions were appropriate, which actions were inappropriate as well as additional actions which could or should have been taken. Responses regarding practitioner actions in the situations are collected in two ways: by asking responders to write down their responses or to discuss their responses in a small group. The written response method is used with novices. The small group is used with experts who are asked to come to consensus on appropriate, inappropriate and further actions. The discussion is audio-recorded. The analysis of the written or transcribed audio-recorded responses involves identifying (a) evaluations of the actions, (b) the recommendations for further action, and (c) the reasons given for the evaluations and recommendations.

A fourth methodology was used in one of the previously completed studies (Cooke, 1988) as a supplement to the above

methods. This method involved an interview in which individuals were asked explicitly to discuss their goals and priorities. Such interviews produce more general concepts about goals and priorities, whereas protocols reveal the goals and priorities that are in operation during transactions with a problem or situation. Since interviews are more subject to editing by the subject than is the protocol, the first three methods described above have been emphasized in the research reported in this document. These research methodologies are more extensively described in previous publications (Thomas, 1988a, 1988b) in relation to the studies in which they were used.

Typically, in expert-novice comparison studies, data are collected from a relatively small number (5-25) of experienced, expert-level practitioners and a similar number of novice-level trainees. The purposes of juxtaposing two extreme levels of expertise are (a) to aid in interpreting the data, (b) to produce contrasts which help to reveal more dramatically the characteristics and patterns of thinking and the knowledge structures of people at each of these expertise levels, and (c) to obtain data which will facilitate diagnosis of novice learners' needs. More recently, one or more mid-level groups have also been included in such research studies in addition to the two extreme levels of the expertise continuum (Dreyfus & Dreyfus, 1986; Patel & Groen, 1988; Scribner, 1984, 1985). Inclusion of mid-level groups increases the difficulty of analyzing and interpreting the data but, if done carefully, is helpful in understanding the continuum of cognitive changes that occur with learning.

The research methodologies described above produce data regarding both prerequisites for higher order thinking and higher order thinking processes. The higher order thinking prerequisites include knowledge structures in which declarative knowledge has been embedded. Examples of these structures include representations of (a) goals and priorities, (b) action plans, (c) themes and (d) task environment features. Examples of higher order thinking processes that are revealed in this type of data include (a) information seeking (which involves selective, strategic attention focusing) and interpretation, (b) inference formation and (c) conclusion formation. Figure 1 reflects these types of data.

Research data from expert-novice comparison studies have revealed that experts are more conscious of their own processes and knowledge (metacognitive awareness) and use this awareness to critique their own strategies and actions. These data are a useful basis for creating learning experiences that develop learners' metacognitive capacities in the context of a specific knowledge domain.

Translating research findings regarding these higher order thinking prerequisites and processes into a knowledge domain requires several additional processes. These subsequent processes and detailed elaborations and examples of the higher order thinking prerequisites and processes are discussed in Chapter 3 in relation to specific components of the knowledge domain. The last three components in Figure 1 will be the focus of Volume II, to be published in 1990. The present volume focuses on all the parts of Figure 1 except the last three components.

Identification of Knowledge Domain

Findings from the expertise studies conducted in 1986-87 (Cooke, 1988; Johnson, 1988; Thomas, 1988a) provided information about knowledge use and thinking processes characteristic of varying levels of expertise in specific knowledge domains. The assessment study conducted in 1987-88 (Thomas, 1988b) provided information about a specific knowledge domain relevant to vocational education and its use in relation to thinking about domain-relevant situations and problems. Further, the assessment study provided information about gaps in learners' knowledge and misconceptions learners hold. It also revealed the impact of those gaps and misconceptions on learners' thinking, on their perceptions and interpretations of domain-related situations and problems, and on their recommendations about actions appropriate for the practitioners in specific situations. Because this information was already available, it was decided to focus development of the instructional prototype on a knowledge domain related to these previous studies. Thus, supporting children's social development was identified as the knowledge domain for which the instructional prototype would be developed.

In addition to already having a useful base of information about this knowledge domain, there were several other reasons for choosing it. First, because supporting children's social development is an area having considerable complexity and imprecision in the judgments it requires of adults who work with and care for children, this domain was seen as providing a stringent test of the instructional design model. This was because students face greater challenges in identifying and defining ill-structured problems in a complex, imprecise domain than in a well-defined domain. Second, a substantial, rigorous, declarative knowledge base exists in this domain. Consequently, the effectiveness of the instructional design in proceduralizing declarative knowledge for application in practice could be adequately tested. Third, training programs have experienced difficulties in developing individuals' knowledge and thinking with respect to this domain using traditional instructional approaches of lecturing, reading and guided field experience.

Thus, this domain was perceived to exemplify characteristics of other difficult-to-teach domains in vocational education in which similar training problems exist. Fifth, as a result of the 1987-88 project (Thomas, 1988b), tested assessment materials focused on the knowledge domain were available which could be used to evaluate the effectiveness of the instructional design. Finally, this knowledge area was one in which the investigator had background, a factor which was of importance in the development of the instructional design prototype.

Identifying the knowledge domain (or area of practice) on which instructional design is to focus, is an initial step in the instructional design model. Chapter 3 reports the processes and their results that produced the structure and content of the knowledge domain identified for development in this initial step.

CHAPTER 3

KNOWLEDGE DOMAIN STRUCTURE AND DEVELOPMENT

Experts display an interrelationship and interaction between their domain knowledge and thinking processes that is believed to be a critical factor in their level of competence. Some theorists believe that the nature of cognitive restructuring that occurs with learning is domain-specific as opposed to reflecting general developmental stages. In other words, the structure of cognition may differ from one domain to the next (J. R. Anderson, 1987; Lunzer, 1986). This is an important issue for instructional design since it has implications for how broadly applicable an instructional design model can be. Based on extensive review of the literature and research completed in the Higher Order Thinking Research Program over the last four years, the authors believe that there are types of specific knowledge domains. Numerous specific domains with similar structures could be better understood in relation to these types if the types could be identified. From an instructional design standpoint, understanding these types of domains would be an important instructional design prerequisite. This project produced an understanding of one specific knowledge domain that is a potential representative of a type of knowledge domain.

Understanding a knowledge domain and its relationship to thinking processes is a requisite step in instructional design for facilitating domain-relevant higher order thinking. Such understanding requires a theory of the domain. This theory should describe the representations, processes and representation-process interactions involved in a knowledge domain (Abbott & Black, 1986). A representation is a recording or expression that corresponds to the original information. A representation is the form information takes once it is contained in the cognitive structure. Representations are reflected when information is expressed by an individual (Glass, Holyoak, & Santa, 1979). Representations enable both understanding of problems or situations and exploration of potential actions that might be taken. Representation-process interactions refer to the interaction of cognitive processes (which include thinking processes) and information contained in representations. Research has revealed that experts' representations are qualitatively different from those of novices. Increasing levels of competence in domain-relevant behavior reflect these qualitative changes in representations, changes which are the result of cognitive restructuring.

Previous Higher Order Thinking Research Program projects have produced findings concerning differences in representations, processes and representation-process interactions in two knowledge domains relevant to areas of practice in vocational education: supporting children's social development and technical troubleshooting (Cooke, 1988; Johnson, 1988; Thomas, 1988a, 1988b). It is anticipated that these two areas of practice represent not only different knowledge domains but also represent different types of knowledge domains.

The approach to knowledge domains emphasized in this research is the functional content approach. In this approach, knowledge domains are viewed as organizing and indexing information content in a way that facilitates information retrieval when needed for task performance (Abelson & Black, 1986). Three levels of organization in a functional content approach to knowledge domains are relevant to higher order thinking. These levels are goals, plans and themes. Context and activities are indexing elements (Galambos, 1986; Reiser, 1986; Siefert, Abelson, & McKoon, 1986). All of these concepts will be discussed in the sections that follow.

The process of knowledge domain development had several stages. The first stage was identification of a goal action structure. This was followed by development of a task environment structure, and finally, identification of domain-relevant thinking processes.

Goal Action Structure

A goal action structure is one type of representation and level of information content organization contained in a functional content view of the type of knowledge domain indicated by the supporting children's social development domain. The identification of this structure is based on research indicating that information is structured in memory in relation to the goals and purposes for which it is sought or encountered (R. C. Anderson, Spiro, & Montague, 1977; Bobrow & Collins, 1975; Glass, Holyoak, & Santa, 1979). Further, goal structures provide indexes by which knowledge stored in memory is activated (Reiser, 1986). These indexes are features relevant to goals of participants engaged in activities. Such features include people's motivations, actions undertaken to satisfy the motivations, outcomes with respect to motivations, and consequences of the actions for the participants (Reiser, 1986). Goal structures connect the external world and the internal knowledge structure and link people's actions and their intentions.

Memory organization units associated with goals have been described as containing a goal source, a goal, and a plan (Abbott & Black, 1986). The goal is the item, event or state

desired and typically involves a change from a current state to a desired one. The plan, on the other hand, focuses on events and actions. The source of the goal focuses on, states and involves the reasons for the goal. The reasons are typically found in (a) thematic expressions of people; (b) a change in a world state (such as natural events, economic shifts, actions by other people, the passage of time); and (c) person-related knowledge structures (such as roles and personality variables). Source-goal-plan units help an individual formulate actions and predictions about possible courses of one's own and others' behavior, and understand possible goals of other people based on observations of their actions.

Goal structures have been characterized as hierarchical structures consisting of main goals and subgoals (Abbott & Black, 1986; Galambos, 1986; Newell & Simon, 1972; Schank & Abelson, 1977). The highest level is the main goal that organizes subgoals. A series of subgoals represented by actions are structured under main goals. Subgoals are the actions that serve and actually accomplish a main goal. Instrumental to the subgoals are plan actions which appear at lower levels in the goal structure.

Planning implies a choice among alternative overall plans and subplans that may need to be developed. Plans are used when unfamiliar or infrequently experienced activities, events and situations are experienced. A more automatic, familiar response is not available for such situations (Schank & Abelson, 1977). Plans are also used to adjust actions that did not work. Plans enable access to information about possible problems which could arise in activities, enable explanation of what has occurred in an event and give predictions about what is to come.

Plans are condition-action units (Larkin, 1979; Simon, 1980b) that contain a series of actions one would perform to attain a particular goal state. Schank and Abelson (1977) describe "plan boxes" as conceptual units which contain the following: (a) controllable, possibly controllable, and uncontrollable preconditions; (b) goals (main goals and subgoals); (c) key action(s) that will accomplish the goals; and (d) results which specify the consequences of the key action(s). Plans connect cues in the external environment, internal mental structures, and acts carried out in the external environment.

The goal action structure represents a basic and important level of learning on a continuum of learning levels. Uninstructed students, or students who have no domain knowledge, are dependent on their senses for understanding situations they encounter. Sensory information is the basis for their interpretations and inferences which are at a descriptive rather than causal level. For example, in working with children, an uninstructed student observing a group of children sitting at a

table with an adult during snack time would be able to say how many people were present, that they were sitting around a table, and that they were eating. A student with some elementary domain knowledge might be able to indicate the approximate age of the children because they would have a knowledge structure for interpreting language usage cues and physical capability cues. Such a student may also note developmental appropriateness of activities, equipment, materials, etc. In contrast, a student with a knowledge structure relevant to supporting children's social development, like the goal action structure described above, would be able to note and interpret the roles the adult assumed and their impact on social development goals for children, patterns in the verbal and nonverbal interaction and their impact on social development goals, patterns in participation of the children and in the opportunities for participation the adult provides, and a host of other deeper, more subtle cues and social development goal-relevant patterns. These deeper, more subtle cues and patterns require more than sensory information to perceive and interpret. Perceiving and interpreting them depends on a goal-related knowledge structure that the individual brings to bear upon the situation. The ability to note and interpret these deeper, more subtle cues and patterns is essential to being able to support children's social development. Consequently, the goal action structure contains representations essential to the function of supporting children's social development. Development of a goal action knowledge structure is therefore identified as the first level of instructional design.

The previously completed expertise study concerning adult-child interaction revealed a number of important differences between the experts and novices in goal action structures (Cooke, 1988). For example, the subgoals expressed by the experts were all child-focused, whereas each novice parent reflected at least one subgoal which revealed a parental perspective that did not reflect attention to cues given by their child. The experts stated a plan for action in almost every episode. These action plans all demonstrated attention to their child's needs in the situation. Novices did not consistently state action plans, and the few plans that were stated did not consistently address their child's needs indicated by the child's cues. In almost all of the segments within each expert episode a complete condition-action unit was expressed. In contrast, all of the data for the novices included a total of only four complete condition-action units (Cooke, 1988).

Several types of materials formed the basis for development of the goal action structure. In addition to the literature on knowledge structures summarized above and the research data, published curricula concerning working with children were reviewed. In addition, the aims, goals, and objectives of

several local child development training programs were reviewed to identify the areas of competence, skill and personal qualities emphasized. Major areas of consistency were identified by this review. Child development research literature regarding adult roles, goals and practices that are supportive of children's social development and several child development texts in the area of social development were also reviewed to identify further areas and potential ways of structuring the domain. A new text (Kostelnik, Stein, Whiren, & Soderman, 1988) specifically devoted to the concept of supporting children's social development and containing developmental principles in relation to social development goals and adult actions was a particularly important and useful resource. This text, written from the perspective of the practice of guiding children's social development, explicitly linked implications for practitioners and parents to knowledge about children's social development and to cultural values influencing what is viewed in the society as desirable or socially competent. These values included responsibility, independence, friendliness, cooperativeness, self-control and purposiveness (Kostelnik, Stein, Whiren, & Soderman, 1988). A goal action structure was developed based on a review of these sources and research previously described.

The framework of the goal action structure that was developed had three levels. The main goal level of the goal action structure was a broad, central goal in children's social development. There were only ten such goals (see Appendix A). This level made explicit the meaning, significance and purpose of the more specific levels of the goal action structure. The second, subgoal level (see Appendix B) reflected general actions too broad to implement without more specificity. Subgoals organized specific actions serving a broad area of social development and provided a link between the specific actions and the highly general main goals. Subgoals were more action oriented than main goals but were not observable without further specificity. The third level, plan actions, reflected acts serving the subgoals (see Appendix C). Actions identified within subgoals were, for the most part, specified at an observable level. The subgoals and actions made the meaning of the more general main goals more explicit.

The goal action structure reflects the relationships between knowledge and practice that result from knowledge proceduralization. Declarative knowledge of children's development was embedded in the goal action structure and was organized in relation to goals and actions rather than in relation to a disciplinary structure. This "knowledge embedded in practice" orientation of the goal action structure reflected cognitive structure characteristics of highly competent individuals studied in the 1987-88 project on expertise (Cooke, 1988; Thomas, 1988a).

The goal action structure was extensively reviewed by a panel of experts. This panel included individuals who were experts in working with children as indicated by their current professional position and recommendations from others. Seven practitioner experts from the fields of child care, early education and child development served on the panel of experts. These experts were on the teaching staffs of technical institutes, colleges and universities and had extensive experience in working with children and in directing and teaching others preparing to work with children.

Thematic Structures

The theme level is a broader, more overarching level than the goal action structure. Themes may be thought of as memory organization units composed of clusters of goals (Abbott & Black, 1986; Schank & Abelson, 1977). These general, high level knowledge structures store together in memory a wide range of highly varied situations from a variety of contexts (Galambos, Abelson, & Black, 1986; Schank & Abelson, 1977). Constructed from experiences with cases, themes organize episodes that may vary greatly on more specific features into goal and plan interaction patterns based on more abstract similarities among the cases (Seifert, Abelson, & McKoon, 1986). Because themes are context-independent, based instead on thematic similarity, they facilitate transfer of goals and plan actions across a wide range of types of situations (Seifert, Abelson, & McKoon, 1986).

Themes provide knowledge relevant to making predictions, deriving expectations and explanations, categorization and planning. Themes concern types of goal relationships, opportunities and difficulties often encountered in pursuing goals, and implications of goal success or failure (Abbott & Black, 1986; Seifert, Abelson, & McKoon, 1986). Like the goal action structure, themes are believed to be used both in organizing memory to aid retrieval and in interpreting new experiences. Types of themes include role themes, interpersonal themes and life themes (Schank & Abelson, 1977). The supporting children's social development themes identified in this project were interpersonal themes.

Themes were identified based on two data collection procedures. Both procedures involved the situation analysis research methodology described in Chapter 2 and more elaborately discussed in the previous assessment publication (Thomas, 1988b). The panel of experts were asked to view 33 video segments of adults interacting with children in various situations. The segments ranged in length from 30 seconds to 7 minutes. As they viewed the segments, panel members were asked to note appropriate actions, inappropriate actions and additional actions that could have been taken on the part of the adults in the scenes. Panel members were asked to discuss the actions they noted and to

reach a consensus on their analysis of each segment. These discussions were tape recorded and transcribed. The transcriptions were content analyzed for recurring, theme level material revealed across the situations in the experts' evaluations, recommendations and reasons.

In a second data collection process, 42 students enrolled in child care or early education programs at different educational levels were asked to view the 23 segments on which the highest degree of consensus was reached in the panel of experts' analysis described above. These students were asked to focus on children's social development while viewing the video segments and were asked to identify the following in writing for each of the segments: (a) appropriate actions taken by the adult in the situation, (b) inappropriate actions taken by the adult, and (c) further actions that could be taken or that should have been taken by the adult. The panel of experts was then asked to rate the student responses as appropriate, irrelevant or inappropriate. Frequency distributions of the panel's ratings were developed to assess the degree of agreement and disagreement among panel members' ratings. The ratings were then examined for overall, general patterns that would reflect theme level generalizations over situations.

Three interpersonal type themes emerged from the data: enjoyment, control-support and task-person focus. The control-support theme was selected for inclusion in the prototype instructional material for the following reasons: (a) it was the most pervasive, general theme across situations; (b) the actions associated with it were repeatedly identified by the panel of experts as having especially significant implications for children's social development; and (c) its expression was often very subtle, requiring a deep level of understanding and high level of knowledge and expertise to detect. This latter attribute of the control theme made it a useful avenue for assuring that the instructional design would be adequately tested for its ability to facilitate advanced level knowledge structures. The knowledge structure for the control theme representation can be viewed in Appendix D.

Other data are available that reveal other types of themes. For example, Cooke's study (1988) discerned several role themes expressed by adults in their work with children. These themes included guide, limit setter/rule enforcer, fellow player, teacher, verbalizer (reflector), model, shower, observer, caregiver and nurturer. In addition, knowledge domain experts have consistently expressed a child learning theme (Katz, 1984).

Task Environment Structure

The task environment is another type of representation relevant to a functional content view of the type of knowledge

domain indicated by the supporting children's social development domain. A task environment refers to representations of the external world in which problems and situations are set (Newell & Simon, 1972). Some theorists believe that types of knowledge domains are differentiated on the basis of differences in the nature of task environments (Brewer, 1987).

Knowledge of the task environment, particularly the features of that environment that are relevant to solving problems arising from it and to goals in the goal action structure, is a critical component of proceduralized domain knowledge. Features may include such things as structure, materials, people and activities. Domain knowledge provides both the prototypic features of task environments and the range and nature of variation that can occur in those features.

As implied above, the goal action structure and the task environment are interrelated. Goals have the special function of linking the task environment, which is external to the person, to the person's internal information processing system (Newell & Simon, 1972). Individuals who possess domain knowledge possess representations that contain task environment features and goal structures which guide their strategies in planning their moves within the task environment. Components of the task environment and their features relevant to supporting children's social development goals are reflected in the goal action structure contained in Appendix C.

Protocol analysis research yields data about features useful for instructional design, particularly such research that compares novices and experts on the following: (a) features attended to; (b) cues that signal a feature; (c) the order in which cues and features are noted; (d) the priority that is given various features by the problem solver; (e) which features are seen as familiar and expected; and (f) which features are seen as unexpected, infrequent or unique. Patterns of feature detection by individuals at different levels of expertise in a domain indicate that novices see descriptive, surface features available to direct sensory perception. Experts have more knowledge of principles and concepts which allows them to see features related to function and relationships (see previous discussion of surface level feature perception in connection with the goal action structure) (Cooke, 1988; Johnson, 1988; Kvistberg, in process; Larkin, McDermott, Simon, & Simon, 1980; Rasmussen & Jensen, 1974).

Major categories of task environment features critical to understanding and competently acting within the task environment, comprise the task environment structure. These major categories are often reflected in practitioner-oriented textbooks. In fact, the main usefulness of textbooks and declarative, disciplinary knowledge is often in relation to task environment feature

categories. Protocol analysis research identifies selection filters by which task environment knowledge stored in memory is activated and used and by which further information is sought from the external task environment. Protocol analysis research also reveals connections between this knowledge and thinking processes.

Because the nature of the task environment is thought to be the basis for differences in specific knowledge domain structures, the structure of task environment representations may vary considerably from one domain to the next. Consequently, it is not possible to say which other knowledge domains may have similar structures. The task environment structure for the supporting children's social development domain that was developed from the research data and other sources is presented in Appendix E.

Context

The context is the setting, environment, or "big picture" and immediate surroundings in which the specific situation or problem exists. The importance of this component and its degree of influence may vary greatly from one specific knowledge domain to the next. Some research has identified context or setting as having a primary indexing function in storing knowledge (Reiser, 1986). Features identified within this feature category (referred to as "environment" in the supporting children's social development task environment structure) are indicated in Appendix E. Context features were identified in the data resulting from the panel of experts' analyses of the 33 video segments described earlier and from practitioner-focused texts.

Central Phenomenon

The central phenomenon is the object of focus, the central interest of practitioners in the domain. The central phenomena is the place in the specific domain knowledge structure where declarative knowledge may reside in its most unproceduralized, most purely declarative form. The central phenomena is often the focus, and too often the only focus, of instruction and textbooks. When this is the case, given the other parts of a knowledge structure needed to support practice as indicated by research, it is not surprising that learners having only declarative knowledge would be able to recall the principles and concepts but unable to know when and where they are applicable and what purposes they might serve. To assume learners will acquire the additional representational structures needed to make knowledge applicable and usable by experience leaves much to chance. Only a portion of the learner population is likely to have opportunities for experiences that help them form the other needed parts of a knowledge structure that is applicable to real world problems and situations and the needed links between these

parts. Even among those learners who have relevant but unguided experience, some may not construct the needed structures and linkages on their own.

Differences in what central phenomenon is of interest have the potential to explain why people with related knowledge backgrounds, but backgrounds which have been learned in relation to different central phenomena, do not seem to be able to grasp the issues and display a depth of understanding of each other's communication or concerns. Several years ago the senior author directed an interdisciplinary nutrition education project. Advisors to the project met together periodically and represented human nutrition science, and several education fields. Five minutes into the discussion at the first meeting it was clear that the focus of these two groups was different. The human nutrition scientists focused immediately on nutrition phenomenon (nutrition principles and concepts) while the educators' initial attention went to the audience for the program (learners). Different central phenomena were revealed in the knowledge structure representations possessed by members of this group.

The concepts and experiences described above suggest an explanation for why thinking, especially higher order thinking with its dependence on knowledge structures, may be very domain-specific. The specificity of task environment representations implies that the features one attends to in a situation vary greatly, depending on the task environment representations one holds. This specificity may also explain difficulties encountered in interdisciplinary research and teaching efforts.

The central phenomena in the supporting children's social development knowledge domain is children. The task environment knowledge structure contained in Appendix E indicates the main features for this category. The primary sources of these features were the protocol analysis data, the experts' situation analysis data and textbooks in the discipline of child development.

Activities

Research has supported activities as a type of task environment representation in a functional content view of knowledge structures (Reiser, 1986). An activity is defined as a self-contained series of actions performed to attain a goal in a particular situation; an action refers to the component actions of an activity (Galambos, 1986). Activity theorists assert that the origins of conscious activity are not to be found in the recesses of the human brain, but in the external conditions of life (Luria, 1982; Wertsch, Minick, & Arns, 1984). Activities are systems with their own structure, internal transformations and development. Play, instruction or formal education, and work

are examples of activities mentioned by Vygotskian psychologists (Wertsch, et al., 1984).

Activity units in the task environment representation identify the socioculturally defined milieu in which the activity occurs. The same activity can give rise to different goals and thus, can produce different actions (Wertsch, et al., 1984). Activities function to orient people in the world of objects. Activities enable inferences about reasons for executing actions and expectations concerning the social roles and physical objects involved in the activity.

Activities appear to be heavily used in comprehension and planning as well as in retrieval (Abbott & Black, 1986; Reiser, 1986; Siefert, Abelson, & McKoon, 1986). Activities provide needed retrieval information at the level at which it tends to be originally represented (Reiser, 1986). Reiser attributes this to the following characteristics of activities: (a) they have more predictive power than do feelings or physical states; (b) they tend to generate more visual mental pictures and imagery; and (c) they are self-contained knowledge structures, complete in themselves rather than being instrumental to some other activity. Vygotskian researchers suggest that activities are an optimal level description of events that take place in physical or social settings because they apply to many varieties of experiences that contain rich detail (Wertsch, et al., 1984).

While activity representations may be organized along several dimensions, the two most important are believed to be centrality and distinctiveness. Centrality is an activity-organizing principle that reflects the importance of an action to an activity. Central actions are the main reasons for doing the activity. Centrality results from the intentional structure of the activities (Galambos, 1986). Central actions require effort and thought (and attention), or the goal of the activity may not be achieved. When central actions occur, they make a big difference to the successful outcome (Leddo & Abelson, 1986). Distinctiveness is a measure of whether an action occurs in one or many activities. Highly distinctive features are unique to an activity or occur in very few activities; less distinctive features occur in many activities (Galambos, 1986). Distinctive aspects of activities are cues to accessing knowledge relevant to the situation. Such cues are the most subtle and expertise-dependent kinds of cues, often embedded in a situation in contrast to more obvious or explicit cues. Distinctiveness is believed to work hand in hand with centrality as a way of organizing information (Galambos, 1986). Centrality indexes an activity according to a general class of activities to which it is related; distinctiveness indexes the activity in ways that allow it to be separated from its general class and retrieved according to its unique features.

Central actions of activities in a novice knowledge structure reflect the concrete actions of the surface, observable activity (e.g., getting food, getting chairs, eating, cleaning up as part of snack time in child care situations). In an expert's knowledge structure, central actions of activities and the goal action structure are closely interrelated. Goals from the goal action structure are selected on the basis of the opportunities for their implementation afforded by the concrete, surface, observable activity and its goals and central actions.

Main features of activities indicated in Appendix E reflect general concepts about activities obtained from research and theory (Argyle, Funham, & Graham, 1981; Clarke, 1985; Ginsburg, Brenner, & von Cranach, 1985; Nuttin, 1980; Rogoff & Lave, 1984; von Cranach & Harre, 1982) and the experts' situation analysis data.

Processes and Representation-Process Interactions

Processes refer to the mental processes that act on and interact with the types of representations described in the previous sections. Data from the research on expertise (Cooke, 1988), the assessment study (Thomas, 1988) and from the panel of experts' responses to the video segments collected during the current project clearly indicate differences between novices and experts in information seeking and interpretation, inference formation, and conclusion formation. Since conclusions require information seeking and interpretation and inference formation, and clearly involve representation-process interactions, they were identified as the central processes in the knowledge domain. Analysis of the protocol data and the situation analysis data revealed four kinds of conclusions having clear interactions with the various representations in the knowledge structure. These four kinds of conclusions were (a) judgments of fact, (b) judgments of compatibility, (c) judgments of priority, and (d) judgments of consequence. Furthermore, literature from the field of practice substantiated the four types of judgment and their importance and basis in advanced knowledge (Katz, 1984; Kostelnik, Stein, Whiren, & Soderman, 1988). Katz (1984) summed up the centrality of well-developed knowledge and judgment processes to expertise in working with children: Practice-related judgments in situations with young children entail the use of advanced knowledge in diagnosing and analyzing events, weighing alternatives and estimating the potential long-term consequences of decisions and actions based on the results of such diagnoses, analyses, weighings and estimates.

Judgments of fact include (a) assessments of the existence of states, (b) the occurrences of events or actions, (c) presence of phenomena or features, and (d) cause-effect relationships. The involvement of judgment processes in the establishment of fact is well documented (Vickers, 1983). This type of judgment

is external-world-focused and depends on the declarative knowledge contained in central phenomenon representations and in other task environment representation categories.

Judgments of compatibility are judgments of appropriateness or suitability. These judgments are of the type, "this 'fits' with this." These judgments of fit often concern the fit of an action not only with a goal but also with the setting or context, the particular attributes, states and features of the central phenomenon, or the activity of the moment. Consequently, this type of judgment requires the goal action structure and all of the task environment representations described earlier.

Judgments of priority involve differential allocation of importance to goals. Such judgments concern raising the importance of one or more goals above other competing goals. Usually goals come into competition when an action that serves one diminishes another. Since it is often possible to find an action that will serve several goals simultaneously, the need for judgments of priority does not arise as often as the need for judgments of compatibility. Judgments of priority require the goal action structure as well as all of the categories of task environment representations and are aided by an additional type of representation. This special type of representation associated with judgments of priority is comprised of decision rules that have been developed either by an individual or a group of practitioners for determining which of one or more competing goals have priority. Such decision rules can be obtained from practitioners who are knowledge domain experts that have consciously thought about the decision rules they use. Protocol analysis research is one approach to determining decision rules. The decision rules contained in Appendix F were first identified in a practitioner-oriented text (Kostelnik, Stein, Whiren, & Soderman, 1988) that contained a section focused on making judgments relevant to supporting children's social development and then reviewed and modified by the panel of experts.

Decisions of consequence require the most depth of insight and understanding and depend on advanced level theme representation structures. Decisions of consequence are decisions about the overarching, far-reaching consequences of patterns. These are judgments about implications at a highly general and abstract level. An example would be judgments about the consequences of a series of action alternatives in terms of the degree to which children have some say in what happens to them. Such a judgment would draw upon the control-support theme representation depicted in Appendix D. These judgments are judgments of meaning at the highest, most general, most abstract level, and, as such, require theme level knowledge structures.

The Tailored Response Test (TRT) developed in 1987-88 (Thomas, 1988b) assesses ability to make judgments. Because the

various types of judgments described above, taken altogether, are dependent on all of the types of knowledge representations, the TRT is an approach to assessing learning related both to the types of knowledge representations as well as the judgment processes.

Appendix G summarizes the processes discussed in this section and reflects their interaction with the various representations described earlier and their relationship to each other. Appendix G indicates the thinking and knowledge interactions that combine as a practitioner encounters, searches for understanding of, and acts to affect situations in the external task environment.

One additional type of thinking process is relevant to the instructional design. This process is metacognition. Metacognition involves observations of, reflections on, analysis of, and evaluation of one's own cognitive processes, patterns and products. Metacognitive reflection differentiated the experts and novices in the expertise studies (Cooke, 1988; Johnson, 1988) and has been identified as a key element in competence (Sternberg & Wagner, 1986). Research has indicated that purposely helping learners become more self-aware of their own cognition as a part of the instructional process increases learning (Brown, 1978).

The next chapter provides information about the approach that was used to prepare instructional material that reflected the knowledge domain described in this chapter.

CHAPTER 4

PREPARATION OF INSTRUCTIONAL MATERIAL TO REFLECT KNOWLEDGE DOMAIN

Developing representations of the types described in Chapter 3 requires that learners experience situations in which the representations are relevant. Thus, a major problem for instructional design is assuring that instructional materials contain and relate to the representations one is trying to help learners develop. This section reports the development and validation of instructional materials that meet these requirements.

Video-taped situations of adults interacting with children during normal, everyday activities were determined to be an instructional material that could reflect the knowledge domain representations in ways helpful for learning. This was thought to be the case because relevant task environment cues are captured and presented by the video tape with little loss in fidelity. In other words, the situations confronted by learners in instruction are like those they will confront in their work in that no problems are defined and needed information is missing. Furthermore, the actions of practitioners can be observed, analyzed and compared in much detail and depth because the situation can be replayed and observed again and again.

The following process was used to obtain video-taped scenes containing features relevant to the goal action structure, theme and task environment representations described in Chapter 3 and that would provide opportunities to engage in the information seeking and interpretation, inference formation and conclusion making processes also described in Chapter 3.

Process of Instructional Material Development

A pool of 107 video-taped segments were available from video taping that had been done previously and in conjunction with the assessment project. Additional information on how these segments were filmed and segmented is presented in the report of that project (Thomas, 1988b). In order to allow use of the assessment tool (known as the Tailored Response Test, or TRT) that was developed in this previous project as a way of assessing learning resulting from the instructional design, the fourteen segments used in the TRT were not considered for inclusion in the instructional material. This left 93 available segments.

All 107 video-taped segments had previously been analyzed for goal actions reflected in the goal action structure (see .

Appendix C) in conjunction with work done on the TRT. This previous analysis was used to determine which of the remaining 93 segments were similar to the segments included in the TRT on the basis of goals, subgoals and actions in the knowledge domain. High potential video segments were identified by their correspondence with segments in the TRT in terms of the goal action structure.

All 107 video segments were then analyzed for content related to task environment features and themes. Themes in the segments had emerged during work on them in the assessment project but no systematic analysis of themes had been done. Task environment features were analyzed mainly in terms of the activities feature category. Activities included lunch, art, science, story reading, dramatic play, outdoor play, games/objects/materials, diapering, hand washing, putting things away, dressing for outside, shoe tying and transitions. At the theme level, the segments were grouped and analyzed on the basis of themes apparent but not confirmed or validated in the previous work: (a) enjoyment, (b) control-support, and (c) task-person focus. An analysis relevant to the goal action level was done in which the segments were grouped and analyzed based on the following types of common situations in child care task environments that afford opportunities to implement supporting children's social development goal actions: (a) cooperation (which was further elaborated as helping, accepting help and sharing behaviors); (b) engagement in interaction and activity (which was elaborated as whether the child approached an adult, an adult approached a child, or the adult and children were together in the situation); (c) child/child interaction; (d) emotions/stresses; (e) rules/expectations; (f) unacceptable behavior; and (g) conflicts/disputes. Segments were given a score of one in each of the various categories within the activity, goal action or theme levels if any features, actions or themes were displayed, and a score of zero in those categories where no features, actions or themes were displayed. The following totals were then tallied for each video segment: (a) total activity features displayed, (b) total goal action features exhibited, (c) total themes indicated, and (d) an overall total. This analysis yielded 21 video segments which had a total overall score of 10 or more. Of these 21 segments, three were eliminated immediately either because they were being used in the TRT or because of poor technical sound or visual quality. The number of segments with tallies in a category was also totaled for each category to determine how many segments reflected the activity, goal action or theme identified by the category. This indicated the degree of choice available in a category for selection of video segments reflecting the category.

The remaining 18 video segments were then evaluated further. First they were re-analyzed for verification purposes along the same dimensions as above. Then the segments were grouped by

activity features, and the aggregate total of the segments were scrutinized for the following: (a) similar activities which showed contrasting goal action structures or themes, (b) similar themes running through varied activities, and (c) similar themes represented in different goal action clusters. All analyses yielded similar data, and the investigators concluded that these 18 video segments would provide an array of material adequate in comprehensiveness with respect to representing the knowledge domain. These segments included almost all of the segments identified as high potential in the previous TRT-related analysis.

These 18 video segments were then presented to the panel of experts for their detailed examination. In addition to discussing each of the segments in terms of appropriate and inappropriate actions reflected in the segment, the panel also discussed and provided more general input on the chosen video segments. Suggestions were made to include more segments where adults were functioning at higher theme levels. Three additional video segments were selected as a result of this recommendation. Suggestions were also made as to appropriate places to cut material from the video segments.

The 21 final video segments selected for inclusion in the instructional material were subjected to the following detailed level content analyses based on activities, goal actions and themes: (a) an analysis of the specific goals, subgoals and actions from the goal action structure included in each segment and whether these were positive or negative examples; and (b) an analysis of each segment for general, cross-situation dimensions reflecting the control-support theme (see Appendix D). These analyses were used to be sure that the instructional material did, in fact, adequately reflect the knowledge domain reflected in Appendices A-E.

Validation of Instructional Material Content in Terms of Learner Responses

Description of Learners

During the 1989 spring quarter, 19 students from three different sites were involved in a pilot-study to test the instructional material for its reflection of the knowledge domain to learners.

Seven students who participated were enrolled in a Home Economics Education class at the University of Minnesota. Six of these students were baccalaureate students majoring in Home Economics Education; one student was in a post-baccalaureate certification program in Home Economics Education. Eleven additional students were enrolled in one-year postsecondary child care training programs at two metropolitan technical

institutes. One student was in a continuing education program in child care at a metropolitan technical institute.

Ages of the students ranged from 19 to 39 years old. All individuals were female. Seven students indicated they were parents.

Procedures for Instructional Material Try Out

As part of the first session, the students took a diagnostic test in which three video segments were shown. Students were then asked to determine whether specific features were similar or different in the three scenes. Depending on which responses students made, they were categorized as either level one or level two in knowledge domain understanding. The diagnostic test was designed to separate students with well-developed goal action structures and some theme level understanding who viewed the scenes in terms of deeper level features from those who lacked goal action structures and viewed the scenes in terms of surface features. Nine students' scores indicated level one and 10 students' scores indicated level two.

Table 1 presents a frequency distribution of the program level in which students were enrolled by diagnostic test results level. Table 2 presents a frequency distribution of students' education prior to enrolling in their current program in relation to diagnostic test results level. A frequency distribution of the ages of students by diagnostic test results level is presented in Table 3. Three of the students who were

Table 1

Students' Current Program by Diagnostic Test Results Level

Current Program	<u>Diagnostic Test Results Level</u>		
	Level 1 (N)	Level 2 (N)	Total
Continuing education	1	0	1
One-year postsecondary child care training program	5	6	11
Bachelor's degree program	3	3	6
Post baccalaureate certification program	0	1	1
Total	<u>9</u>	<u>10</u>	<u>19</u>

Table 2

Students' Previous Education Prior to Enrolling
in Current Program by Diagnostic Test Results Level

Prior Education Completed	<u>Diagnostic Test Results Level</u>		
	Level 1 (N)	Level 2 (N)	Total
None	5	4	9
One-year postsecondary program	1	1	2
Two-year, non-degree postsecondary program	1	3	4
Associate degree	2	1	3
Bachelor's degree	0	1	1
Total	<u>9</u>	<u>10</u>	<u>19</u>

Table 3

Students' Age by Diagnostic Test Results Level

Age	<u>Diagnostic Test Results Level</u>		
	Level 1 (N)	Level 2 (N)	Total
19-22	6	1	7
23-26	1	4	5
27-30	1	2	3
31-34	1	0	1
35-39	0	3	3
Total	<u>9</u>	<u>10</u>	<u>19</u>

parents scored at level one in the diagnostic test and four scored at level two.

The video segments were presented to students on a Level III video disc and in the context of a computerized instructional program that guided their viewing of the segments. Development of the video disc and the instructional program will be described in detail in Volume II which focuses on the instructional design.

Those students who attended the University of Minnesota used the program for about one hour per week for six consecutive weeks during the quarter. Students attending the two technical institutes used the program for a two- to three-hour block of time, one time only. All sessions were audio taped and at the end of the sessions, an interview was conducted. All students took the diagnostic test individually. Some individuals went through the remainder of the program individually, whereas other students went through the program as part of a two- or three-person group.

Student Responses in Relation to Knowledge Domain

Students were encouraged to voice their responses and discuss the questions presented throughout the program. Those individuals who met in a group were more inclined to discuss some of the questions than students who worked individually. The questions were intended to elicit knowledge domain responses from the students. The following questions from the interview conducted at the end of each session elicited knowledge domain responses: (a) What are your reactions?, (b) Were there any things you liked or didn't like?, (c) Do you feel you learned anything? If so, what?

Responses of students categorized as level one and level two on the diagnostic test were analyzed separately. Student responses were categorized by components of the knowledge domain they reflected: (a) goal action structure, (b) themes, (c) task environment, and (d) judgment processes. This initial analysis was conducted to see if the video material presented in the instructional design did, in fact, reflect the knowledge domain in the experience of learners with the material. The categorized student responses are presented according to diagnostic test results level in Appendix H. Some students viewed the instructional material in groups of two or three and some as individuals. The responses included in Appendix H were student-initiated observations, or answers to questions the students were asked either by the video disk program or by the researcher conducting the follow-up interviews after each session. The week in which the expressions occurred are indicated since some students experienced the material over a six-week time period. Even a quick perusal of Appendix H reveals the more extensive, more highly developed knowledge domain structures and more complex levels of thinking among level two students.

Appendix H also contains comments of students that reflect metacognitive processes and general comments about their experience with the video scenes. These students all experienced a portion of the instructional design for level one students since the level two design had not yet been created. The general comments of the two groups further support the content validity of the diagnostic test in separating the two groups. Level one

students' comments reflected the feeling that they had learned new things. Level two students' (who all experienced the level one material only) comments reflected the feeling that they had had a review and were not challenged. Level two instructional design will focus on the theme level which was not addressed in level one.

Results and Conclusions

According to this initial analysis of learner responses, the instructional material does appear to adequately reflect the knowledge domain to learners. Connections were made by students between the video segments and all categories of the knowledge domain. It should be noted that responses indicating judgments of consequence reflect theme level knowledge structures.

The try out test also provided support for the content validity of the diagnostic test. This was indicated by the more extensive responses of level two students (as is evident in Appendix H) and by their more extensive responses in the advanced knowledge domain components (themes) and the most advanced knowledge domain--process interactions (judgments of consequence). The diagnostic test appears to be able to separate students on the critical variable of knowledge domain representations possessed by the students. Furthermore, this information provides useful insight into assessing learning of knowledge domain structures, insight that will be helpful in planning assessment of learning resulting from the instructional design that is being developed.

The various and extensive analyses that were done on the video segments appear to have produced an instructional material that matches the knowledge domain. Consequently, the instructional material should be adequate to the instructional design task which is in progress. The students' responses will be further analyzed, especially in terms of looking more deeply into the differences between level one and level two students' responses, to inform future work on the instructional design.

Reflections on Knowledge Domain Development Portion of Instructional Design Model

The instructional design model for facilitating knowledge domain-related higher order thinking, to be presented in Volume II, has been introduced to some extent by Figure 1. Although the final model will be more detailed and extensive, the parts of Figure 1 represent critical parts of the model: (a) the research to understand higher order thinking in a domain, (b) the development of a model or models of the representations experts in a knowledge domain possess, (c) the thinking processes central to a domain and the ways in which they draw on the representations, and (d) the design of instruction to assist

learners in developing the representations and the thinking processes.

There have been several useful discoveries resulting from this phase of the project:

1. General cognitive research theory can be translated into more specific concepts directly relevant to a specific knowledge domain.
2. The translation is not direct. Additional research is needed to determine what the specific concepts are and how they can be related to the more general theory. This project is an example of this type of research.
3. What is typically taught in educational programs too often leaves parts of the knowledge structure out.

Themes and thinking processes are the most likely candidates for exclusion in much of the instruction that occurs in educational programs. This is because they are the least concrete areas and educators who themselves possess them will find it difficult to be consciously aware of them. Vocational programs may do better than other types of educational programs in developing goal action structures. Research would help clarify if this is the case and whether the emphasis may be too much on subgoals and actions and too little on main goals and on linkages between main goals, subgoals and actions.

A number of processes and procedures have been developed and tested that will be usable in subsequent research and in instructional development. The principles used to create the diagnostic test (similarity in activity features, contrast in goal action features) seem to have operated very well. The student responses strongly support the theory underlying the diagnostic test and the entire knowledge domain structure. This is encouraging. Another encouraging result is the rapidity with which students appear to gain deeper level insights after only a short exposure to the instructional program. Since development of that program is still in process and will be reported in detail in Volume II, it is not described here.

The formal testing of the knowledge domain will occur simultaneously with the testing of the instructional design in which it is embedded. That information will be reported in Volume II and will include further information about the content validity of the knowledge domain structure and the impact of the knowledge domain on higher order thinking of learners.

Summary and Recommendations

The recommendations indicated here should be viewed as tentative until the knowledge domain created in this project is formally tested along with the instructional design currently under development. However, as a way of drawing intermediate closure around the ideas and findings presented here, the following recommendations and implications for vocational education are proposed.

The knowledge domain development portion of an instructional design model has been illustrated in this document. This work has revealed that knowledge domains underlying expertise and higher order thinking are more extensive than the content identified for instruction in educational programs often reflects. The most important aspect of this extensiveness is the different kinds of knowledge structures reflected in the illustrative domain presented in this document. The knowledge structures included in this illustrative domain imply a view that understanding involves, in part, figuring out what is superordinate and what is contributory. The goal action structure and the theme structure reflect these relationships between what is broader and more general (superordinate) and what is detailed and specific (subordinate, contributory). The research underlying the domain indicates that expertise requires both the broad and the specific as well as clarity about the patterns of linkages between them. To have only the more specific levels is to have limited ability to adapt and to be unable to think at the higher levels. To have only the broad, general levels is to be immobilized, unable to act upon conclusions. The importance of knowledge organization (levels and patterns of linkages between them) to its usability is apparent in the results of this study.

Implications for vocational education reflected in these findings concern both the content of what is taught in vocational education and the organization of that content in relation to what a particular vocational education program is trying to achieve. This study provides a model usable by vocational education instructors for analyzing the goals of their programs and their program content for the levels and types of knowledge structures appropriate for their students. Vocational educators can use this portion of the instructional design study as a basis for scrutinizing and developing the organization of content in their curricula and instructional designs in relation to the thinking processes and the goal structures, action plans and themes important for their students to possess. Finally, vocational educators can use this study to analyze and develop their vocational education program content for task environment structures so that their organization and content makes them relevant to rapidly changing real-world environments.

Implications for the instructional design phase of the project, currently in progress, are apparent in the results of the try out and the data presented in Appendix H. The video-disk medium being used was positively responded to by the students at all educational levels. The plan for a two-level design was supported by the data. Revisions in wording and routing of parts of the video-disk program can be made on the basis of the feedback from students. In addition, data was collected regarding patterns of routing used by students in the try out and is being analyzed in relation to their responses to questions in the video-disk program. This data is relevant to the instructional design and will be reported in Volume II.

REFERENCES

- Abbott, V., & Black, J. (1986). Goal-related inferences in comprehension. In J. Galambos, R. Abelson & J. Black (Eds.), Knowledge structures (pp. 123-144). Hillsdale, NJ: Erlbaum.
- Abelson, R., & Black, J. (1986). Introduction. In J. Galambos, R. Abelson & J. Black (Eds.), Knowledge structures (pp. 1-18). Hillsdale, NJ: Erlbaum.
- Alexander, P., & Judy, J. (1988). The interaction of domain-specific and strategic knowledge in academic performance. Review of Educational Research, 58(4), 375-404.
- Anderson, J. R. (1987). Skill acquisition: Compilation of weak-method problem solutions. Psychological Review, 94, 192-210.
- Anderson, R., Spiro, R., & Montague, W. (Eds.). (1977). Schooling and the acquisition of knowledge. Hillsdale, NJ: Erlbaum.
- Argyle, M., Furnham, A., & Graham, J. (1981). Social situations. Cambridge: Cambridge University Press.
- Bobrow, D., & Collins, A. (Eds.). (1975). Representation and understanding: Studies in cognitive science. New York: Academic.
- Bransford, J., Franks, J., Vye, N., & Sherwood, R. (1986, June). New approaches to instruction: Because wisdom can't be told. Paper presented at the Conference on Similarity & Analogy, University of Illinois.
- Bransford, J., Sherwood, R., Vye, N., & Rieser, J. (1986). Teaching thinking and problem solving: Research foundations. American Psychologist, 41, 1078-1089.
- Brewer, W. (1987). Schemas versus mental models in human memory. In P. E. Morris (Ed.), Modeling cognition (pp. 187-197). New York: Wiley.
- Calderhead, J. (1981). Stimulated recall: A method for research on teaching. British Journal of Educational Psychology, 51, 211-217.

- Champagne, A., Klopfer, L., & Gunstone, R. (1982). Cognitive research and the design of science instruction. Educational Psychologist, 17, 31-53.
- Cheng, P. & Holyoak, K. (1985). Pragmatic reasoning schemas. Cognitive Psychology, 17, 391-416.
- Clarke, D. (1985). Action systems. New York: Methuen.
- Cooke, B. (1988). Mental processes and knowledge underlying expertise in parenting. In Thomas, R. (Ed.), Thinking underlying expertise in specific knowledge domains: Implications for vocational education (pp. 39-84). St. Paul: University of Minnesota, Minnesota Research and Development Center for Vocational Education.
- Dreyfus, H. & Dreyfus, S. (1986). Mind over machine: The power of human intuition and expertise in the era of the computer. New York: Free Press.
- Ennis, R. (1989). Critical thinking and subject specificity: Clarification and needed research. Educational Researcher, 18(3), 4-10.
- Ericsson, K. & Simon, H. (1984). Protocol analysis. Cambridge: MIT.
- Flanagan, J. (1954). The critical incident technique. Psychological Bulletin, 51, 377-358.
- Galambos, J. (1986). Knowledge structures for common activities. In J. Galambos, R. Abelson, & J. Black (Eds.), Knowledge structures (pp. 21-47). Hillsdale, NJ: Erlbaum.
- Ginsburg, G., Brenner, M., & von Cranach, M. (1985). Discovery strategies in the psychology of action. New York: Academic.
- Glaser, R. (1984). Education and thinking: The role of knowledge. American Psychologist, 39, 93-104.
- Glass, A., Holyoak, K., & Santa, J. (1979). Cognition. Reading, MA: Addison-Wesley.
- Johnson, S. (1988). Knowledge and skill differences between expert and novice service technicians on technical troubleshooting tasks. In R. Thomas (Ed.), Thinking underlying expertise in specific knowledge domains: Implications for vocational education (pp. 39-85). St. Paul: University of Minnesota, Minnesota Research and Development Center.

- Katz, L. (1984). The professional early childhood teacher. Young Children, 39(5), 3-10.
- Kostelnik, M., Stein, L., Whiren, A., & Soderman, A. (1988). Guiding children's social development. Cincinnati: South-Western.
- Larkin, J. (1979). Information processing models and science instruction. In J. Lockhead, & J. Clement, (Eds.), Cognitive process instruction (pp. 109-118). Philadelphia: The Franklin Institute Press.
- Larkin, J. (1987). Robust performance in algebra: The role of the problem representation. In C. Kieran & S. Wagner (Eds.), Proceedings of the research agenda project on algebra (pp. 1-29). Athens, GA: National Council of Teachers of Mathematics.
- Larkin, J., McDermott, J., Simon, D., & Simon, H. (1980). Expert and novice performance in solving physics problems. Science, 208, 1335-1342.
- Laster, J. (1985). Using cognitive psychology in curriculum planning. Information Series 297. Columbus, Ohio: The National Center for Research in Vocational Education.
- Lave, J. (1985). Introduction: Situationally specific practice. Anthropology and Education Quarterly, 16, 171-176.
- Leddo, J., & Abelson, R. (1986). The nature of explanations. In J. A. Galambos, R. P. Abelson, & J. B. Black (Eds.), Knowledge structures (pp. 103-122). Hillsdale, NJ: Erlbaum.
- Siefert, C., Abelson, R., & McKoon, G. (1986). The role of ~~Lesgold, A. M. (1986) structure~~ Human skill in a computerized society: Complex skills and their acquisition. Pittsburgh: University of Pittsburgh, Learning Research and Development Center. (ERIC Document Reproduction Service No. ED278 358)
- Lunzer, E. (1986). Cognitive development: Learning and the mechanisms of change. In G. Phye, & T. Andre (Eds.), Cognitive classroom learning: Understanding, thinking, and problem solving (pp. 277-316). Orlando: Academic.
- Luria, A. (1982). Language and cognition. New York: Wiley Interscience.
- Marion, M. (1981). Guidance of young children. Columbus, OH: Merrill.
- Messick, S. (1984). The psychology of educational measurement. Princeton, NJ: Educational Testing Service.

- Minnesota Department of Education. (1988). Students must be better prepared for work. Education Update, 23(1).
- Minnesota Research and Development Review Committee for Vocational Education. (1985). Proposed R & D Priorities for 1986-87. Unpublished policy recommendations.
- Minnesota Research and Development Review Committee for Vocational Education. (1986). Proposed R & D Priorities for 1987-88. Unpublished policy recommendations.
- Minnesota Research and Development Review Committee for Vocational Education. (1987). Proposed R & D Priorities for 1988-89. Unpublished policy recommendations.
- National Academy of Sciences. (1984). High schools and the changing workplace: The employers' view. Report of the Panel on Secondary School Education for the Changing Workplace. Washington, D.C.: National Academy Press.
- Newell, A., & Simon, H. (1972). Human problem solving. Englewood Cliffs, NJ: Prentice-Hall.
- Norman, D. A. (1980). Cognitive engineering and education. In D. Tuma, & F. Reif (Eds.), Problem solving and education: Issues in teaching and research. Hillsdale, NH: Erlbaum.
- Nuttin, J. (1980). Motivation, planning and action. Hillsdale, NJ: Erlbaum.
- Patel, V., & Groen, G. (1988, April). Toward a unified theory of problem solving: A view from medicine. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.
- Quellmalz, E. (1985). Needed: Better methods for testing higher order thinking skills. Educational Leadership, 43(2), 29-35.
- Quinby, N. (1985). On testing and teaching intelligence: A conversation with Robert Sternberg. Educational Leadership, 43(2), 50-53.
- Rasmussen, J., & Jensen, A. (1974). Mental procedures in real-life tasks: A case study of electronic trouble shooting. Ergonomics, 17, 293-307.
- Raven, J. (1984). Competence in modern society: Its definition, development and release. London: H. K. Lewis & Co.

- Reiser, J. (1986). The encoding and retrieval of memories of real-world experiences. In J. Galambos, R. Abelson, & J. Black (Eds.), Knowledge structures (pp. 71-99). Hillsdale, NJ: Erlbaum.
- Rogoff, B. (1984). Introduction: Thinking and learning in social context. In Rogoff, B. & Lave, J., Everyday cognition: Its development in social context (pp. 1-8). Cambridge, MA: Harvard University Press.
- Schank, R., & Abelson, R. (1977). Scripts, plans, goals and understanding. Hillsdale, NJ: Erlbaum.
- Schon, D. (1983). The reflective practitioner. New York: Basic Books.
- Scribner, S. (1984). Studying working intelligence. In Rogoff, B. & Lave, J., Everyday cognition: Its development in social context (pp. 1-8). Cambridge, MA: Harvard University Press.
- Scribner, S. (1985). Knowledge at work. Anthropology and Education Quarterly, 16, 199-206.
- Sherwood, R., Kinzer, C., Bransford, J., & Franks, J. (1987). Some benefits of creating macro-contexts for science instruction: Initial findings. Journal of Research in Science Teaching, 24, 417-435.
- Short, E. (Ed.). (1984). Competence: Inquiries into its meaning and acquisition in educational settings. Lanham, MD: University Press of America.
- Siefert, C., Abelson, R., & McKoon, G. (1986). The role of thematic knowledge structures in reminding. In J. Galambos, R. Abelson, & J. Black (Eds.), Knowledge structures (pp. 185-210). Hillsdale, NJ: Erlbaum.
- Spiro, R., Coulson, R., Feltovich, P., & Anderson, D. (1988) Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains. In V. Patel, & G. Groen (Eds.), Proceedings of Cognitive Science Society, 1988. Hillsdale, NJ: Erlbaum.
- Spiro, R., Vispoel, W., Schmitz, J., Samarapungavan, A., & Boerger, A. (1987). Knowledge acquisition for application: Cognitive flexibility and transfer in complex content domains (Technical Report No. 409). Champaign: University of Illinois at Urbana-Champaign, Center for the Study of Reading.
- Sternberg, R. (1985). Beyond IQ: A triarchic theory of human intelligence. New York: Cambridge University Press.

- Sternberg, R., & Wagner, K. (Eds.). (1986). Practical intelligence: Nature and origins of competence in everyday world. Cambridge: Cambridge University.
- Thomas, R. (1988a). Thinking underlying expertise in specific knowledge domains: Implications for vocational education. St. Paul: University of Minnesota, Minnesota Research and Development Center for Vocational Education.
- Thomas, R. (1988b). The tailored response test: An approach to assessing higher order thinking related to work roles and contexts. St. Paul: University of Minnesota, Minnesota Research and Development Center for Vocational Education.
- Thomas, R., & Litowitz, L. (1986). Vocational education and higher order thinking skills: An agenda for inquiry. St. Paul: University of Minnesota, Minnesota Research and Development Center for Vocational Education.
- Thornton, R. (1988). Evaluation of a scannable method of scoring open-ended-response simulations. Unpublished manuscript, Educational Testing Service, Princeton, NJ.
- Vickers, G. (1983). The art of judgment. New York: Methuen.
- von Cranach, M., & Harre, R. (1982). The analysis of action. Cambridge: Cambridge University Press.
- Wertsch, J., Minick, N., & Arns, F. (1984). The creation of context in joint problem-solving. In Rogoff, B., & Lave, J., Everyday cognition: Its development in social context (pp. 151-171). Cambridge, MA: Harvard University Press.

APPENDIX A

Supporting Children's Social Development Goal Action Structure: Main Goals¹

- I. Build positive relationships with children through nonverbal communication
- II. Promote children's self-awareness and self-esteem
- III. Respond to children's emotions
- IV. Enhance children's play
- V. Foster self-direction in children
- VI. Help children understand stressful situations in their lives and learn to use effective strategies when facing them
- VII. Help children understand, accept and value individual differences and similarities
- VIII. Influence children's social development via structuring the environment
- IX. Support children's friendships
- X. Promote responsible social behavior

¹Adapted from Kostelnik, M., Stein, L., Whiren, A., & Soderman, A. (1988). Guiding children's social development. Cincinnati: Southwestern.

APPENDIX B

Supporting Children's Social Development
Goal Action Structure: Main Goals and Subgoals

Supporting Children's Social Development
Goal Action Structure: Main Goals and Subgoals¹

- I. Build positive relationships with children through nonverbal communication
 - A. Use positive, nonverbal communication with children
 - B. Show warmth and caring
 - C. Demonstrate acceptance and security
- II. Promote children's self-awareness and self-esteem
 - A. Formulate fundamental skills associated with a positive verbal environment
 - B. Formulate behavior reflections
 - C. Formulate paraphrase reflections of children's verbal expressions
 - D. Formulate questions
 - E. Promote self-esteem in all children
- III. Respond to children's emotions
 - A. Formulate affective reflections of children's emotions
 - B. Help children to increase their verbal expressions of emotions
 - C. Help children to cope with difficult emotions
- IV. Enhance children's play
 - A. Set the stage for children's play
 - B. Maximize the play potential of the materials available
 - C. Help children to acquire skills through involving self as a player
 - D. Help individual children change the level of their social participation in play
 - E. Escalate the level of play gradually by varying play performance or by giving cues through play signals or metacommunications
 - F. Coach children occasionally from outside the play frame
 - G. Become directly involved in children's playfulness
 - H. Demonstrate awareness of children's individual differences

¹Adapted from Kostelnik, M., Stein, L., Whiren, A., & Soderman, A. (1988). Guiding children's social development. Cincinnati: Southwestern.

- V. Foster self-direction in children
 - A. Reflect on problem situations
 - B. Express emotions to children
 - C. Pinpoint behaviors
 - D. Formulate reasons
 - E. Formulate rules
 - F. Implement logical consequences when children break rules
- VI. Help children understand stressful situations in their lives and learn to use effective strategies when facing them
- VII. Help children understand, accept and value individual differences and similarities
- VIII. Influence children's social development via structuring the environment
 - A. Establish a daily schedule
 - B. Change the qualities of the room to correct problems in or to further enhance a positive atmosphere of the environment
 - C. Effectively manage materials for children's use
 - D. Manipulate the environment to minimize conflict
 - E. Help children to make decisions and to manage independently
- IX. Support children's friendships
 - A. Create an environment in which children's friendships are respected and encouraged
 - B. Teach children how to role play
 - C. Carry out friendship coaching
- X. Promote responsible social behavior
 - A. Create a prosocial environment
 - B. Provide direct instruction related to prosocial behavior

APPENDIX C

Supporting Children's Social Development Goal
Action Structure: Main Goals, Subgoals and Actions

Supporting Children's Social Development Goal
Action Structure: Main Goals, Subgoals and Actions

I. Build positive relationships with children through nonverbal communication

A. Use positive, nonverbal communication with children

1. observe the nonverbal behavior of children
2. recognize the cultural and family variations in children's nonverbal behavior
3. maintain the integrity of children's proximal space
4. use nonverbal signals to gain the attention of a group of children who are engaged in an activity or who are dispersed in space
5. walk up to children with whom you want to communicate and orient self in a face-to-face position
6. keep all channels of communication consistent when communicating feelings
7. touch the child
8. stand, sit, or squat close to the child, not more than an arm's length away
9. sit or stand so that your head is at the same level as the child's head
10. maintain frequent but not continuous eye contact with the child
11. face the child so that your shoulders and the child's shoulders are parallel
12. lean slightly toward the child
13. participate in nontraditional gender role activities

B. Show warmth and caring

1. convey a generally positive facial expression in neutral situations
2. respond as quickly as possible when spoken to and take the time to listen
3. use voice tones that are normal to soft in loudness and normal to low in pitch and a voice quality that is relaxed, serious and concerned when talking with children

¹Adapted from Kostelnik, M., Stein, L., Whiren, A., & Soderman, A. (1988). Guiding children's social development. Cincinnati: Southwestern.

C. Demonstrate acceptance and security

1. maintain a tone of voice that is firm, warm, and confident--the pitch should be even and the volume normal
2. relax, maintain close physical proximity, maintain arms and legs in an open or semi-open position
3. use hands to gesture appropriately or, if necessary, to grasp the child until the communication is complete
4. accept both sexes participating nontraditional gender role activities

II. Promote children's self-awareness and self-esteem

A. Formulate fundamental skills associated with a positive verbal environment

1. greet children when they arrive
2. address children by name
3. extend invitations to children to interact with you
4. speak politely to children
5. listen attentively to what children have to say
6. invite children to elaborate on what they are saying
7. think of some conversation openers in advance
8. remain silent long enough for children to gather their thoughts
9. take advantage of spontaneous opportunities to converse with children
10. refrain from speaking when talk would destroy the mood of the interaction
11. use encouraging responses so children feel better about themselves
12. use positive verbal reinforcement for cross-gender role activities and play
13. help children express pride in their own cultural heritage

B. Formulate behavior reflections

1. describe some aspect of a child's person or behavior in a statement to the child
2. phrase behavior reflections as statements
3. address behavior reflections directly to children

C. Formulate paraphrase reflections of children's verbal expressions

1. listen actively to children's words
2. restate in own words what a child has said
3. rephrase own erroneous reflections

4. match reflections to each child's ability to understand language
5. use a conversational tone when reflecting
6. summarize children's actions and words rather than reflect each individual behavior or idea expressed
7. select one idea at a time to paraphrase from the many a child may express
8. add interest to reflections by periodically phrasing them in a form opposite from that used by a child
9. reflect first when children ask a question

D. Formulate questions carefully

1. ask open-ended questions
2. ask questions when truly perplexed
3. carefully choose open-ended questions
4. emphasize quality over quantity in using questions in conversation with children

E. Promote self-esteem in all children

1. make every child the object of daily focused attention
2. treat all children with respect regardless of gender, ethnic background, social class and/or handicapping condition

III. Respond to children's emotions

A. Formulate affective reflections of the children's emotions

1. observe children carefully before saying anything
2. remain sensitive to the wide range of emotions that children exhibit
3. make a nonjudgmental assessment of what a child is experiencing
4. make a brief statement to a child describing the emotion you observed
5. use a variety of feeling words over time
6. acknowledge children's emotions even when you don't approve of them
7. revise inaccurate reflections

B. Help children increase their verbal expressions of emotions

1. set an example for talking about emotions by bringing them up yourself

2. explain to children who are involved in emotional situations that they can tell their emotions to another person
3. assist children in describing their emotions to others if they cannot do so entirely on their own
4. help children decipher behavioral cues that tell how another person is feeling
5. draw children's attention to situational cues that contribute to people's emotions
6. expand children's vocabulary to facilitate communication of troubled feelings and thoughts
7. encourage both boys and girls to express their emotions
8. increase children's sensitivity to their own body sensations when they feel angry, sad, tense, joyful, and so on
9. teach children to practice positive self-talk in tense situations

C. Help children to cope with difficult emotions

1. acknowledge children's negative emotions and forbid destructive actions
2. comfort children of both sexes who are sad or afraid
3. help children sort out mixed emotions
4. provide children with information that may enlarge their perception of a situation
5. provide opportunities for children to observe how others of both sexes cope in a situation they fear
6. allow children to approach a feared situation gradually
7. help children think of new strategies or learn new skills as a way to deal with difficult emotions
8. give children opportunities to work out their feelings through play
9. use ordinary experiences and daily activities to discuss feelings, thoughts and behaviors that people use when they are afraid, uncertain, faced with change or overwhelmed by what is happening to them
10. anticipate and rectify situations in which children may be unduly frustrated
11. remain alert to children for whom frustration is building

IV. Enhance children's play

A. Set the stage for the children's play

1. establish the necessary conditions for play
2. say to yourself, "It's okay to play, to laugh, to have fun."
3. stand or sit near children at play
4. pay attention to what children are playing, and what they say and do
5. schedule playtime in segments that are long enough for play concepts to be developed
6. prepare children for a change in activities by warning them in advance that the change will occur
7. send children to an activity rather than away from one
8. provide adequate space for the number of children playing
9. provide quality playthings for all types of play for both boys and girls
10. remain alert for valuable learning experiences that may be created spontaneously by children, being flexible enough to let them progress without interruption
11. rechannel group play in which children pretend to kill one another

B. Maximize the play potential of the materials available

1. mix unrelated toys together
2. introduce novel toys and materials slowly
3. rotate playthings
4. arrange the materials to encourage interaction between children
5. encourage children's novel use of more traditional (gender related) toys

C. Help children to acquire skills through involving self as a player

1. play with the materials
2. take a role to encourage pretend play
3. demonstrate movements as necessary
4. participate fully in the game
5. demonstrate that you can play in nontraditional play roles (cross gender)

D. Help individual children change the level of their social participation in play

1. observe children for cues that the present level of participation is inadequate

2. match the activity to a child's level of skill
 3. play with the child
 4. invite the child and a second player to play with you, then ease out of the situation
- E. Escalate the level of play gradually by varying play performance or by giving cues through play signals or metacommunications
1. extend object play by imitating what a child is doing, then vary the activity a little
 2. suggest that children use specific play signals to initiate or sustain play
 3. withdraw from the play and resume the role of observer once the play is well under way
- F. Coach children occasionally from outside the play frame
1. suggest a related theme
 2. add a necessary prop
 3. introduce new players from outside the play frame
 4. teach players to use a clear signal when leaving the play frame
 5. make suggestions to further the goals of children, such as pointing out a problem or restating game rules
 6. teach children games when necessary
 7. encourage children when they play with nontraditional (non-gender-linked) toys and play in nontraditional (non-gender-related) roles
- G. Become directly involved in children's playfulness
1. demonstrate a nonliteral approach to resources
 2. be accepting of young children's humor
 3. explain that a child was only joking when someone misinterprets the meaning of what was said or did not recognize a play signal
 4. use affective reflections when children laugh at disfigurement, falls or handicapping conditions; then, provide brief but accurate information
- H. Demonstrate awareness of children's individual differences
1. accept young children's approach to games with rules
 2. match the play activity with the skills of the players regardless of gender
 3. accept children's play style preferences regardless of gender

4. provide support for children when other children out perform them in play
5. support children in their choice of play activities, not limiting play to sex-stereotyped choices

V. Foster self-direction in children

A. Reflect on problem situations

1. observe children carefully before reflecting
2. formulate reflections that accurately describe the child's perspective
3. remind self to describe the child's point of view before your own
4. pay attention to children's age when deciding which type of reflection to use
5. avoid using "but" as a way to connect the reflection to the rest of the personal message
6. mediate children's conflicts
 - a. initiate the mediation process
 - b. clarify each child's perspective
 - c. sum up the situation
 - d. assist the children in generating alternatives
 - e. help the children agree on a solution
 - f. reinforce the problem-solving process
 - g. aid the children in following through on their agreement

B. Express emotions to children

1. identify the emotions you experience
2. be sensitive to own array of internal cues that signal a particular emotional state
3. use a wide range of feeling words of different intensities

C. Pinpoint behaviors

1. name the behavior that is affecting you
2. describe the behavior, not the child

D. Formulate reasons

1. give children specific reasons for why you approve or disapprove of their behavior
2. phrase reasons in terms children understand
3. give a reason every time you attempt to change a child's behavior

E. Formulate rules

1. study child-development norms
2. get to know the children in her/his group as individuals
3. think about what combinations of knowledge and action children must carry out to successfully follow a given rule
4. only implement legitimate rules
5. tell children what the rules are
6. reward children's approximations of a rule
7. revise unreasonable rules
8. use language that is clear and to the point
9. ascertain whether children have the same understanding of the rule that you do
10. when in doubt, assume that children have not understood, rather than concluding that they are deliberately breaking the rule
 - a. repeat words more slowly and articulate more clearly
 - b. rephrase message in simpler, more familiar language and emphasize key words
 - c. restate message using a combination of gestures and words
 - d. take a child into an area where there is less interference from noise and other distractions
 - e. emphasize message using physical prompts such as pictures or objects in combination with gestures
 - f. demonstrate what you want by doing it yourself
11. practice thinking about what you want children to do as well as what you wish they would refrain from doing
12. catch yourself saying "No" or "Stop," and rephrase negative instruction as a positive statement
13. tell younger, less experienced children what the alternatives are--let older or more experienced children generate alternatives for themselves
14. set consistent limits on children's aggressive behavior

F. Implement logical consequences when the children break rules

1. anticipate logical consequences that fit the rules you make
2. give children opportunities to generate their own ideas for rules and consequences
3. articulate consequences in the form of a warning
4. give children warnings privately
5. point out the natural consequences of children's actions

6. use the personal message, warning and follow-through in order
7. allow children enough time to respond to each step of the sequence
8. finish the follow-through once it's begun
9. communicate with the other adults regarding rule enforcement
10. avoid power struggles
 - a. avoid making unnecessary rules
 - b. avoid embarrassing children in public--keep all communications between self and child private
 - c. remain calm
 - d. avoid contradicting children's assertions
 - e. stick to the main issue--do not become involved in an argument over extraneous details
 - f. discuss the power struggle privately with a child (this strategy is particularly effective with older children who have learned some attributes of compromise). Tell the child directly that a power struggle seems to be developing and that you would like to work out the issue in another way
 - g. avoid entrapment--when children begin to argue, refuse to become involved (do this either by quietly repeating the rule and the consequences and then resume normal activity, or tell the child that you would be willing to discuss it later when both you and the child are more calm)
11. teach children self-instructional strategies
12. actively attempt to alter children's faulty perceptions
13. prepare in advance to use time-out
14. use time-out only with children who are having a temper tantrum or who exhibit habitual antisocial behavior
15. intervene immediately in aggressive encounters
16. respond immediately to children's verbal hostile aggression using the warning and follow-through parts of the personal message
17. talk and act simultaneously to respond to children's unprovoked hostile aggression and to stop children's actions that may be harmful to themselves or others using the warning and follow-through part of the personal message
18. attend to the victims of aggression

VI. Help children understand stressful situations in their lives and learn to use effective strategies when facing them

1. use appropriate vocabulary when discussing death and dying

2. describe death in terms of familiar bodily functions
3. explain why the death has occurred, giving children accurate information
4. explain death rituals as a means by which people provide comfort to the living
5. answer children's questions about death matter-of-factly
6. respect families' prerogatives for giving children religious explanations about death
7. explain to children that divorce is the result of "grown-up problems"
8. acknowledge the pain that divorce inevitably brings to children
9. help children formulate ways to cope with aggressors beyond the adult's jurisdiction
10. teach children specific relaxation techniques
11. help children practice imagery

VII. Help children understand, accept and value individual differences and similarities

1. educate self about persons of varying cultural, religious, racial and developmental backgrounds
2. evaluate own responses to the sensitive areas of sexuality, ethnicity and handicapping conditions
3. identify the children who have health-related problems or developmental delays
4. respond thoughtfully to children's questions about sexuality, ethnicity, and/or handicapping conditions
5. use correct vocabulary when referring to body parts, cultural groups, or handicapping conditions
6. react calmly to children's sexual play
7. provide natural opportunities for children to learn more about their sexual development
8. help children develop appreciation for our diverse heritage as a society
9. utilize rules and consequences to let children know that purposeful slurs and unkind references to particular children or groups will not be tolerated
10. monitor all teaching materials and activities for racial, cultural, class, gender role, sexual, religious and developmental stereotypes
11. respect cultural and experiential differences in children

VIII. Influence children's social development via structuring the environment

A. Establish a daily schedule

1. plan the schedule in detail and write it down
2. describe the daily schedule to children
3. tell children in advance that a transition will occur
4. walk children through the schedule on their first day or assign another child to escort them when moving between unfamiliar places
5. send children to an activity rather than away from one
6. evaluate the effectiveness of the schedule at regular intervals
7. build relaxing breaks into the program
8. provide opportunities for vigorous daily exercise

B. Change the qualities of the room to correct problems in or to further enhance a positive atmosphere of the environment

1. determine whether or not the physical environment supports goals for children
2. add or subtract objects in the physical environment to achieve specific goals related to children's social development
3. eliminate unnecessary competition
4. eliminate aggressive materials from the setting

C. Effectively manage materials for children's use

1. store materials to be used by children in durable containers near the point of first use and so that they are easy to reach, grasp and use
2. establish specific locations for materials so that children will know where to put them away
3. check equipment and the materials to be sure that they are complete, safe and usable
4. demonstrate the proper use and care of materials
5. give reasons for the standards that you have set
6. supervise the process of putting materials away, giving reminders as necessary, praising children who are achieving the standard and those who help others to do so

D. Manipulate the environment to minimize unproductive conflict

1. provide only enough chairs for the maximum number of children that can participate in an activity

2. encourage children to personalize their space by letting them make room decorations, use the bulletin boards and have a display area
3. provide for appropriate activities for a private space
4. use materials that are developmentally appropriate
5. use furnishings of appropriate size
6. provide materials in an appropriate number for the task and the situation
7. for young children, especially toddlers, provide duplicate or near duplicate play materials
8. arrange the space so that children can get materials and take care of them without interfering with the other children

E. Help children to make decisions and to manage independently

1. offer many different choices to children each day
2. take advantage of naturally occurring situations in which to offer choices to children
3. offer choices to children using positive statements
4. offer choices for which you are willing to accept either alternative the children select
5. allow children ample time to make their decisions
6. allow children to change their minds if the follow-through on the decisions has not yet begun
7. assist children in accepting responsibility for the choices they make
8. allow children, within their developmental abilities, to collaborate with you on major management problems such as the storage of materials, proposed rearrangement of space or planning a special activity
9. allow children to participate in decision making and conflict resolution
10. allow children to experience the positive and negative consequences of their decisions unless doing so would endanger their safety, their physical health or their emotional health

IX. Support children's friendships

A. Create an environment in which children's friendships are respected and encouraged

1. provide opportunities for children to be with their friends informally--to talk, to play and to enjoy one another's company
2. plan ways to pair children in order to facilitate interactions

3. pair a shy child with a younger playmate who is less sophisticated socially
4. take children's friendships seriously
5. carry out group discussions that focus on children's self-discovered similarities
6. help children learn each other's names
7. give children on-the-spot information to help them recognize the friendly overtures of others
8. help children recognize how their behavior affects their ability to make friends
9. get children involved at the beginning of a play episode so that they will not be viewed as interlopers
10. help children endure the sorrows of friendships
11. carry out group discussions that highlight friendship-related facts and principles
12. plan how to modify individual differences that cause children problems in their interactions with others
13. design teaching skits that demonstrate friendship skills to children
14. encourage older children to make up skits of their own that dramatize a problem with friends

B. Teach children how to role play

1. explain what role playing is
2. set the scene
3. help the role players get into character
4. watch the role players attentively
5. discuss what occurred during the role play episode
6. ask the children to develop alternate scenarios
7. summarize the key points of children's discussion

C. Carry out friendship coaching

1. select a skill to work on
2. initiate coaching
3. describe the skill to the child
4. demonstrate the skill to the child
5. provide a rationale to the child for the skill
6. tell the child to practice the skill
7. evaluate the child's use of the skill
8. repeat the coaching procedure several times

X. Promote responsible social behavior

A. Create a prosocial environment

1. take advantage of naturally occurring opportunities to label children's prosocial acts

2. point out instances in which an unintended lack of kindness was shown and describe an alternative, prosocial approach
3. create opportunities for children to cooperate
4. create opportunities for children to help
5. explain potential or current deviations from rules that are made in order to promote helping responses
6. reward prosocial behavior
7. administer group rewards
8. model a variety of prosocial behaviors
9. model constructive ways of responding to other people's prosocial behavior
10. be positive when engaging in prosocial behavior
11. point out the prosocial behaviors modeled by self and others
12. build a positive social climate in which both similarities and differences are valued
13. build a cooperative, rather than a competitive, spirit within the group

B. Provide direct instruction related to prosocial behavior

1. observe children for signs of prosocial behavior
2. make children aware of when someone needs help
3. teach children signals that they might give to elicit help or cooperation from others
4. point out situations in which people could decide to help or cooperate
5. discuss situations in which it would be best to decide not to cooperate
6. assist children in determining what type of help or cooperation is most suitable for a particular situation
7. work with children to evaluate the results of their actions
8. encourage children to accept help from others
9. support children when their attempts at kindness are rebuffed
10. use teaching materials, strategies and resources that promote divergent as well as convergent thought in the context of social situations
11. learn about what goes on in children's lives away from the program and take this into account when planning for children
12. model nonaggressive behavior
13. point out instances of accidental aggression when they occur
14. use substitution in response to children's expressive aggression
15. praise children when they attempt nonaggressive solutions to difficult situations

16. provide accurate information when children assume that, because society condones aggression in one arena, it is permissible in all arenas
17. point out to children that individuals can choose nonaggressive solutions to problems
18. use planned activities to increase children's awareness of alternatives to aggression

APPENDIX D

Control-Support Theme Actions

Control-Support Theme Actions

Control Perspective

Adult/child interaction
 No name use except for control
 Decide on and communicate solutions to child

Verbalization
 Tell; ignore
 Value-based labels
 Threaten
 Shoulds
 Give rules
 Adult language & concepts

 Unnecessarily do for child rather than verbally direct child
 State expectations
 Ask if child wants X

Give solutions

Interpret, judge

Communicate without getting child's attention

Do activity even if child is bored, uninvolved

Divert, distract child

Little eye contact or positive visual expression

Focus attention on own needs, task, things, other people of interest to self; ignore child; self absorbed

Support Perspective

Child/child interaction
 Use names frequently

 Promote children helping each other, mutual problem solving
 Get children to use words to communicate with each other

Verbalization
 Reflect; acknowledge
 Concept-based labels
 Ask
 Encourage
 Give reasons
 Concepts and language understandable by children
 Let child do for self if able, or verbally direct if needed
 Guide discovery
 Let child ask for X

Let children problem solve; ask questions

Get information, observe

Get child's attention before communicating

Engage, stimulate encourage child's interest

Join children in play

Much eye contact, positive visual expression

Focus attention on child; interact with child; alert to, tuned in to children

Control Perspective
(continued)

Body position above child or far away

Adult needs, feelings, agenda, predominate; ignore children's cues; person in charge and dependent relationship

Intrusive, interrupting

Expectations for child based on adult's needs and desires

Treat all children alike, regardless of needs, nature, etc.

Use stock approaches

Order, command

Move child into needed position vis a vis adult

Fast, urgent, pressured pace, voice tone, movements, touch

Paced suited to adult

Task oriented

Product oriented, get job done

Concerned with order, discipline

Rigid, judgmental, rejecting

Support Perspective
(continued)

Body position near child and at child's level

Sensitive to children's needs, feelings, agenda, cues; incorporate, combine, integrate own agenda with child's; reciprocal, mutual relationship

Follow child's lead; enter child's space and activity only enough to support child's goal and maintain safety

Expectations for child based on developmental level and unique characteristics

Respond to/address individual differences

Tailor approach uniquely to the situation

Give choices

Move self into needed position vis a vis child

Patient, calm, supportive, warm, gentle, relaxed voice tone, movements, touch

Pace suited to child

Child oriented

Process oriented, learning opportunity oriented

Concerned with learning

Flexible, accepting, accommodating

Control Perspective
(continued)

Plod on, plow ahead regardless
of children's response

Punish aggressor (make stop)

Focus on the conventional way,
caretaking, control, limits
(e.g., gender issues, manners,
doing it "right," do things for
child that child could do)

Provide unneeded assistance

Reward children for performance,
compliance

Initiate activities adult likes,
that meet adult's goals and
which child may not be able to
do

Give child image, view adult
sees as desirable

See children's behavior as
threat to authority (personal
interpretation)

Do task by self

Connect with children through
directives, criticism, advice

Support Perspective
(continued)

Change things midstream if
children are not responding

Focus on victim (feelings,
self protection) and teaching
aggressor what cues to look
for and how to interpret them

Allow children freedom to
explore, do for self
(e.g., gender issues, self
help; let child do it)

Let child do for self

Respect children as persons;
reward their efforts,
independence, creativity,
discovery, persistence

Let child initiate activities
they like; offer
developmentally appropriate
activities

Provide accurate, extended,
learning opportunities for
children to develop their own
views

See children's behavior as
expression of individual and
developmental needs and
natures (objective
interpretation)

Involve children in task

Connect with children through
talking, playing together,
facial and physical
expressions

APPENDIX E

Task Environment Feature Categories and Main Features

Task Environment Feature Categories and Main Features

Feature Category: Environment

Main Feature: type of setting (background context)

Sample feature variables: preschool/nursery school, day-care center, family day-care, private home

Main Feature: immediate physical environment

Sample feature variables: facilities (safety, design, walls, sound control, lighting, vertical and horizontal space); set up (spaces, boundaries, pathways, supervision)

Main Feature: immediate temporal environment

Sample feature variables: time schedule, order of activities, flexibility, amount of time available

Main Feature: immediate social environment

Sample feature variables: organization, group size/history/characteristics/culture, emotional tone

Feature Category: Children

Main Feature: developmental levels

Sample feature variables: physical development, cognitive/language development, social/emotional development

Main Feature: individual and gender-related differences

Sample feature variables: behavior patterns, levels of participation, social/physical/cognitive skill levels, temperament, likes and dislikes, play styles, unique characteristics, experiences outside this environment

Feature Category: Activity/Situation

Main Feature: types

Sample feature variables: structured, emergent/informal

Main Feature: boundaries

Sample feature variables: space, time, participants, start and end

Main Feature: elements

Sample feature variables: Goals/purposes, roles,
rules, participants, props/materials/equipment,
moves/procedures/operations/tasks, skill and
understanding requirements, behavioral sequences
and details

APPENDIX F

Decision Rules for Establishing Priorities Among Competing Goals

1. Preserve children's safety goals; takes precedence over all others
2. Maximize positive and minimize negative outcomes
3. Children's developmental needs have priority over adult's needs
4. Goal that has fewest opportunities to be addressed over time has priority over goals with more such opportunities
5. Long-term goals take priority over short-term goals
6. Priority on meeting individual needs over group needs unless group functioning is jeopardized
7. More developmentally significant goals take precedence over less developmentally significant goals

APPENDIX G

Thinking Processes Sequence and Interaction with
Task Environment, Goal Action and Theme Representations

Thinking Processes Sequence and Interaction With
Task Environment, Goal Action and Theme Representations

Information seeking
and interpretation:

Size up situation

- Environment features: type of setting, physical, time, social
- Children features: developmental level, age, gender, individual differences
- Activity features: types, boundaries, elements

Inference making:

Read social signals

- Child, children's perspective(s), emotional & physical states
- Other's perspective(s), emotional & physical states

Conclusion making:

Select appropriate goal(s)

- long-term, developmental
for individual child
for group
- short-term, situational
for individual child
for group

Decide on a line of action

- compatibility with children's developmental level, experiences, individual characteristics
- impact on children's perspective, emotional and physical states, learning
- impact on others' emotional and physical states
- compatibility with environment, activity/situation features
- long- and short-term goal achievement potential
- compatibility with all relevant goals and with priorities among goals; resolve compatibility issues; apply decision rules

Action:

Act

Information seeking
and interpretation,
inference making,
conclusion making:

Monitor impact/consequences (intended and
unintended) of action

- on goals
- on children
- on environment
- on activity

Conclusion making,
action:

Adjust action or, if necessary, adjust goals

APPENDIX H

Responses of Students Categorized by Diagnostic Test

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Responses of Students
Categorized as Level 1 by Diagnostic Test^{1,2}

I. Reflections of Knowledge Domain Structures in Student Responses Regarding Instructional Material

A. Goal Action Structure (see Appendices A, B, C)

1. Reflections of Main Goals

(Week 1) I feel that I still have a long ways to go when it comes to observing the children, but I believe that I have gotten a fairly good start and a good sense of what we're supposed to be doing and it's a matter of experience and working with others who have been involved with children and picking up on some of their concepts and helping to formulate what my final outcome, what my goals are when dealing with children and working with them.

2. Reflections of Sub-goals and Plan Actions

(Week 1) Yeah, expectations of the adult, some teachers minded if they were up and down, in and out although the teacher wanted the kid to sit exactly on the chair and look in a direct way. It didn't seem like they had high expectations, but yet the expectations are on *. Do you suppose that would be different? I don't remember if it continues.

(Week 1) Yeah, I was surprised looking at those three, they're all snack time and were all the same age group with one adult, but they were really different as far as everything..., how the kids acted, how the role models acted.

(Week 1) Actions regarding the time schedule. Write down the schedule and activities. Making sure that it's age appropriate. Maybe ask the kids...
Yep. Ask the kids what they want to do.

(Week 5) I don't think anything was really new. I guess just seeing direct and indirect, what you say and how you say it. I think it's good to be reminded of that.

(Week 5) I felt this was, to me, elementary, I guess, because this was stuff that I think I'm naturally attuned to. Subtle and not-so-subtle ways of communicating with children. Explicit and

* = inaudible material

¹Quotation marks indicate that a student is repeating a question posed on the computer screen.

²Students' first expression of the knowledge domain component is highlighted in bold.

implicit communication. I think it's really good to have it laid out here, it makes it clear for me. But I think that's something I've really been conscious of in the last few years when I've worked with children, whether it's my cousins or somebody I'm babysitting. To make sure you're not telling them "No, no," all the time, but tell them what to do instead of what not to do all the time. Just ways of communicating in a healthy way that makes them not feel like they're bad, but their behavior needs to change. It's not a reflection of their personality. That's my reaction.

(Week 6) I liked the way the teacher talked to the kids, especially with the face paint. I just thought she handled that really well. I understand completely what they're saying. I've been trying to be more aware of how I talk to kids when I'm around them, and try to always make it positive, in a way that shows them how I'm feeling so they know, or make them think about what they're doing instead of judging them by making a statement about it. I think the biggest thing that made me really look at myself was when they said that when there's two messages, the verbal and the nonverbal, the nonverbal will usually have more influence or more power. The child will notice that more. So if they are inconsistent with each other, like you have a frown on, and you're saying something nice, they're not going to notice the nice thing, they're going to notice that you have a frown. I find myself doing that a lot, if I'm crabby. I try to be positive, but they know. So I think that was an important revelation for me. To hear that said to me.

(Week 6) I feel that I've been more aware of everything I say, but mostly what I do and how I act when I'm saying it, when I'm around kids. I just think you can't stress that enough, because no matter how much you try to fake it, if you're crabby or don't like what they did, even if you're saying something nice, it's how you say it and what you look like when you're saying it. So that's important for me to keep in mind.

(Week 6) I like this section because it was about communication. Because I think that's vitally important, and it just reinforced and gave me ideas of how to do that. So I really enjoyed this section. It was good.

(Week 6) Of course, because I've had Child Development or whatever, this is just--it's a review, but it's good to see that to be reinforced of how to communicate.

B. Task Environment Structure: Environment (see Appendix E)

1. Reflections of Type of Setting

(Week 1) It must be a nursery school then.

(Week 1) Yeah. We can't tell the difference between a nursery school and a day-care.

We've never been in a nursery school. We've always been in day-cares or pre-schools.

The thing is, it's not real easy to tell the difference. So I think what I'm going to have to do is write it different. Since everyone has done it.

Cuz you didn't show any toddlers.

That's telling me that I need to change something.

Because a day-care would mainly show toddlers and maybe infants. These were all one age.

(Week 2) Tell us if it was a nursery school, or were they different types of settings?

2. Reflections of Immediate Temporal Environment

(Week 1) Well, the time schedule...was pretty synchronized on there, where they had the snack, and then they had the--like, preparing to go home, so they had on coats, and some were in another area that there was a time schedule, where they knew where they was going, and what was supposed to have been did. I liked the way it went.

(Week 1) Did it appear as if there was enough time for the children to finish snack?

Yes.

Yeah. Because...

Plus they let them talk while they were picking things up and such. The other one was...

(Week 2) Yes, there was enough time for snack.

3. Reflections of Immediate Physical Environment

(Week 1) The first one they were sitting really close to all those toys. I thought they might play with that puzzle. In the second one they were sitting in the middle of the room.

By the counter.

Yeah.

The kitchen.

(Week 1) They were the same in terms of safety of the facilities.

(Week 1) They were different.

Different.

You are wrong.

This is bogus.

They were both in exactly the same place.

Yeah, but they were different. The one table was all lit up because it was underneath the toy section, the other table was in the middle of the floor with different things on the walls. I don't ... There were different things on the walls. Yes, there were different things on the walls, but it was the same kind of walls. Oh, yeah, they were the same kind of walls. Same thing. Yeah, same thing.

(Week 1) This is kind of fun. A little piano in there.

(Week 1) The storage...

(Week 1) "What are some specific ways that adults can change the facilities of the physical environment in terms of safety considerations?"

Yeah. * safety considerations.

Age appropriate toys. Maybe make sure there's enough chairs. There are safety factors and considerations when you go outside. Having rules.

What are some specific ways that adults can change the facilities of the physical environment in terms of design considerations?

Have the walls simple, you know, not cluttering up the walls.

Maybe different posters and things on the walls.

Appropriations of space, built in cubbies . . . What else? Oh, we got to think in terms of design.

I think there should be more open space so those people wouldn't have to eat all over *

Yeah the tables are too close.

They should have oblong tables. Instead of round tables.

A long table you can put 10 kids around. Even more children. A small table you can only put 6 comfortably.

What else?

In terms of design.

Everything looks kind of short. *

Yeah. I think it's for the kids.

(Week 1) Because the first one you have walls and the third one has got a mirror on one side and the science table you don't see... I couldn't tell...

It did look like two different... and the colors were totally different.

They were two different rooms, but they were in the same...

Same nursery school?

One looked older... * one newer, laminated tables and newer stuff.

(Week 1) Like the kind of stuff we did about designing your own environment and that could be a thing you could put in.

Yeah. We knew a lot of that already.
Like for sound have soft stuff around.

(Week 3) It said a lot on the environment of a child. I go into those day-cares and think "oh what a jungle, what a maze." I don't know how they know. But it is, it's all designed for boundaries. That is very important then for kids to know what you do in one place, and the environment reflects that purpose and the path ways in the furniture. I mean I saw that there but I didn't know, I thought, isn't that cute. I never knew there was a reason for it.

(Week 3) Yeah, I do. I think I learned a lot. I really enjoyed the children, safety, space, and boundaries and designations of certain areas.

(Week 3) "What are your reactions?"
Kind of what we went over in class today.
What did you go over?
Physical environment.
Did you treat it like this today?
She went over space and design, and the organization.

4. Reflections of Immediate Social Environment

(Week 2) But, as far as really realizing the time of the schedules and how routine they are and how unroutine they are really affects the children and the emotional tone of a certain setting and things that you don't really pick up, just when you walk into a day-care or a nursery school. You might feel it intuitively and after seeing it all laid out for you, and computing "oh, yea, that's really true". It's not something the average person would walk in and know, know that it had that much of an effect on the kids. Yeah.

(Week 4) I guess I was made aware of the specific social things, that I *. I learned like what peer pressure *. That was good. Just the dynamics of the group as children. It was interesting.

C. Task Environment Structure: Central Phenomenon--Children (see Appendix E)

1. Reflections of Developmental Principles

(Week 1) And the age of the children were from 2 1/2 or 3 to about 5. You could see it in some of them, definitely in the way they were acting and behaving.

(Week 1) Um, for me it was really, I work in a day-care center with that age exactly, so to me that was just, I don't know, I didn't really, I don't know if I'm supposed to be able to get

anything out of it because it was just so normal for me to view that, I see that everyday.

D. Task Environment Structure: Activities (see Appendix E)

1. Reflections of Elements

(Week 1) There were different levels of participation of the children, but they all participated because they were all sitting around the table together eating, so that could be both in my mind.

(Week 1) I mean, because in the last group they really weren't interacting or talking very much, they were just eating. Then in the other groups they were talking with the teacher more and with each other a little bit.

Well, it's good to see that, you know, that their patterns were kind of somewhat like that to what I'm used to.

(Week 1) I don't know if the spread for the crackers is different, but they didn't use it at some of the tables.

(Week 1) She was carrying the milk carton.

(Week 1) They were both in round chairs.

Also, they were both using the same containers.

But they weren't drinking the same stuff.

So that's a difference. One table had a whole bunch of kids.

And the first table.

The first table had seven kids and an adult.

II. Reflections of Judgment Processes in Student Responses
Regarding Instructional Material

A. Judgments of Fact (see p. 26)

(Week 1) That last girl was kind of strange. I suppose she hadn't finished eating, you could see it in her eyes.

(Week 1) But it wasn't that close. It was too tall for them to get hold of it. That was the way they were different.

(Week 5) I guess I learned the terms that you'd call the indirect and direct communication. Whenever you say something, you're always implying something else. I liked that, when they said, like "Pet the cat gently," and you're assuming that the child knows what gently means, and knows that he or she is in control of his or her behavior, how hard he puts pressure on the cat. I mean, that's something--when you say something to a child, you don't always think that you're assuming that they know all these other things, and what if a child doesn't know one word? And they may look at you and not know how to ask you what

it means. But they may misbehave, and you're thinking they're misbehaving when they really don't understand what you said. So I think that's really--that helped me and it made it clearer for me.

B. Judgments of Compatibility (see p. 26)

(Week 1) Actually, I thought the one group of kids talking and counting were older, and that the last group the kids seemed to be younger but then that could be the teacher, because the first one wanted them just to kind of socialize together, the second one she didn't have enough kids so she had to do all of the talking. The third one, she didn't look at them and they were kind of lost, and they knew the routine a little bit but she had to help them sit in a chair.

III. Metacognition--Self-focused Observations (see p. 28)

(Week 1) I'm surprised at how having done two observations already that I probably missed tons of things just like you say they sit down at a table to have snacks and that's it. Well, there's so much more going on. So many things that I should really be observing if I want to do something in depth. That's my biggest reaction I think.

(Week 1) Yeah, I learned what to watch for.

(Week 1) That's fine because I don't know a lot about the physiological development of stages. I mean I've read and take child's psych., but it's not the same. I think I have a fairly good perception if I could learn what I'm suppose to be looking for. I think I could do that well, but it's just a matter of learning the facts to basically *. How to compare it, so.

(Week 1) I think, for sure, just for myself when I observe next time I will not just look at the facts or the scenes for what it is at first sight, but to look at what some of the action patterns are and interactions between people or what's really happening.

(Week 1) I guess what helps out first is that when it comes to observing there's just so much to see. It's hard pick up a *. It's not as easy as it looks.

(Week 1) I noticed that in some cases I wasn't paying specific attention or good attention to the obvious details as far as the types of containers or type of drink, but was trying to relate more to the children and their individual age levels and the activities that were going on.

(Week 1) I liked the questions.
Me too.

They were specific, made you think.
Made you think. Especially with the little video parts.

(Week 2) I skimmed through, I mean I read it, but it's kind of stuff I would want to write and organize on my own and then I would reread it. It's like those are critical points and I'd take notes in class or something. Then I'd remember it for a test or incorporate it.

(Week 2) I feel I learned, like I skimmed over a lot of information that was almost too much to absorb, so like say, it was broken in parts, partly because I would read it and then I'd move on, instead of maybe sitting and reviewing in my mind. Because I know there are helpful things there, but it's the kind of stuff that I would want to have at my fingertips when I was making the curriculum or maybe writing an observation or whatever that I could look back on and say now these are the guidelines, let me review these and make sure I'm getting all of them. But as far as me being able to, you know, relay back to you right off the top of my head, I didn't absorb that well. That's me though, that's the difference.

(Week 3) I got a lot out of it. I'm just thinking I should go slower and try to absorb things more as I was looking at this I was trying to review a little of what I've learned.

(Week 3) I thought I absorbed more this time. Because of the questions at the end that were asked, like what can an adult do to make the environment better for a child based on things that I didn't see earlier. And that made me think a little more if I was going to set up a playschool or something for a child, you really do have to think about what space and how you use it and how you designate certain spots for certain activities depending what day it is. That's important. I don't know, I guess I just didn't really think about it as important. The space, boundaries and pathways.
I thought it was good. That I learned.

(Week 3) It might have just been that the concepts were easier to remember too. I don't know.

(Week 4) I enjoyed the social. That was more interesting for me than some of the other ones. I enjoyed that, it was interesting. Watching some of the videos again and pointing out some of the social stuff was good. I didn't see it the first time. Of course, I wasn't looking for that, either.

IV. Overall General Comments

A. Meaning of Terms

(Week 1) How do you define small group? That could be three or it could be seven or eight.

(Week 1) Not really, I felt a little uneasy about, like I said, picking those things out because I wasn't exactly sure what they meant participation of children and participation of adult, it was kind of vague. So, I can't do much about it.

(Week 1) Yeah, yeah I think basically just those things to be a little clearer, I don't really know how you could.

(Week 1) Would you say that there is a definition for what constitutes a small group in this case? I would was thinking maybe five to ten.

(Week 1) Expectation of the adults, you mean what the adults expected of the children.

(Week 1) I thought it was day-care just because there were so many kids in a big area. In nursery school I thought the classrooms were smaller.

(Week 1) To me a nursery school is 2-1/2 to 3-1/2, pre-school is 4 till school age and up.

(Week 1) There's a lot more preschools than nursery schools. My idea of nursery school is because I have a niece that is in nursery school and she is two. And not until she gets to be 3 can she bump up to the preschool. Preschool to me is "ABCD" and they get to write and they make you sit down more and make you attention span longer, where nursery school is just a socialization. That's basically what my idea was of a nursery school.

B. General Comments

(Week 1) And how you can run--like the one with the milk when she had that girl get it, and there was some things in which she wouldn't be able to get it for her... It was really good. But she got the stuff.

(Week 2) It was interesting and had very good points. I think it was a lot. Yes.

(Week 2) They had very, very distinct points, I mean they didn't beat around the bush or like when you did read it, it was very exact and to the point. It was a good guideline for putting ... for working with children, for developing a program. The information was great.

(Week 2) I liked the information. I liked what you were giving to me, there were some very good points.

(Week 3) Maybe it wasn't really anything new. Although you know this whole subject like she said today is so basic really, not that it isn't important, but a lot of this is just common sense stuff and so you know, you think it's good just to get a review of it.

Responses of Students Categorized as Level 2 by Diagnostic Test

I. Reflections of Knowledge Domain Structures in Student Responses Regarding Instructional Material

A. Goal Action Structure (see Appendices A, B, C)

1. Reflections of Main Goals

(Week 1) It reinforces what I've learned in the past as to how important it is for there to be appropriate communication.

2. Reflections of Sub-goals and Plan Actions

(Week 1) I learned a little bit of how to interact with kids just by what some of the teachers were doing in situations...

(Week 1) That last lady that we saw. She wouldn't indicate very much confidence with kids. She looked like she wanted that cracker. And she didn't help. She kept eating the crackers.

(Week 1) Yeah, the first girl did good. Yeah. She was just natural. She was polite to them.

(Week 1) In the first one, the kids seemed more relaxed. Yeah. It did. I think that teacher just had more, none of them were out of control, she just interacted with them. She was real natural.

(Week 1) They were into there being different things that were around them. There was really good interaction between them, a lot of good eye contact, too.

(Week 1) The first lady talked to them all the time. And whenever they started talking about something, she elaborated on it, tried to get them talking about it. I noticed, too, that she didn't discourage them if they gave a wrong answer. She just agreed, you know, "That's right, that's right," even when the answer was not quite-- And eye contact. She had eye contact with everybody. She used an excited voice, and the other gal was just about the same. In everything, yeah.

(Week 1) expectations?

I'd say "Save your wiggles for outside" is the expectation.

Yeah.

Do you agree?

Sure.

That is correct. Yaaaay! So that's an expectation.

Yeah.

They all are, aren't they?

"Sit all the way in your chair." Yeah, they all are.

(Week 1) That's a yes. Oh!

"Save your wiggles for outside."

Is she saying that directly to the person, where in the video she was saying "Let's save our wiggles," so she's not pointing the finger at him.

So--

So "You can't sit still"--

--is no.

Yeah.

How about "Save your wiggles for outside"?

Yes.

That's yes.

(Week 1) What about the first one. She let the child get the milk.

She gave good examples.

Because she listened to what they said.

(Week 2) Oh, I like that third, fourth one. "Send the children to an activity rather than away from one." Yea, I like that. That's positive. I like "describe the daily schedule to the children." You know, that's good. "Can you think of other actions an adult could take regarding the time schedule?" Well, are we talking positive actions or negative actions. It doesn't matter. Negative actions could be rigid and inflexible. It is now 4:05 and you are to be over there into that activity. You're still sending them from one activity to another, but bingo the clock says. Oh, "allow the children to have some say in the daily schedule," some planning. Um hum. You know, you can set that up in a real informal, simple way, so that they can have some input into their schedule when, you know, how much time you want for outside play. Okay.

(Week 2) It's just talking about how adults have expectations and rules for children and how they give them. Rules like situations for need or opportunity, source of need, realizing the opportunity.

(Week 2) What rules did the adults communicate? I saw the difference in the second video. She was much more, she did more of the work for the kids, the full work, whereas the other teacher was allowing them to ask for the crackers, rather than

"now, I'm going to pass around the bowl and you grab the cracker." "This is what you're going to do." Well, I think too, the second one was saying * I think that's expectations more than the rules.

(Week 2) What I've noticed is that the day-care center was, when the kids would be fighting or not fighting, or just getting in a conflict, and the teachers would say friends, you know, you start with that. I thought that was really interesting. That kind of label. Starting off with we're not enemies here, friends in fight, friends in a conflict.

(Week 2) I did like, there was one question of "can you think of any other ways that you could help facilitate a child's, the time schedule or something like that, what ways" and they listed some ways of doing that. I remember that was good for me to think about. I think I had mentioned something like managing, if kids have, can take part in organizing, in the organization of their day, their daily schedule. That was *. I thought that was a good question, a good thinking question.

(Week 2) I think there was a good example about the teacher going up to each child and saying you've got 5 minutes instead of screaming to the class or telling a few, you know, it was like each child, you've got 5 minutes. I thought that was a good approach.

(Week 4) Oh. She gives the choices, didn't she.
Yes.

(Week 4) She didn't really tell her. I thought she might but you need Jennifer's permission, but...I think that's why *, there wasn't an established, firm rule about it, there was a little bit...some from the other kid.
Everything came from the second person.

(Week 5) You are a wiggly person? No, that's not behavior focused. "Save the wiggles for outside." That's behavior. That person has wiggles. What would be person is person-focused, you know, so that person would be no.

Think so?

Yeah.

"He can't sit still."

No.

This one's right.

"Save your wiggles for outside."

(Week 5) We had been talking about the role of the teacher and this just plugs right into those things.

(Week 5) It was an interesting contrast of direct and indirect expectations. That was really interesting and helpful to have

that clarified because I initially saw indirect expectations and I thought it was something different, like body language and... Nonverbal.

Nonverbal, yeah. But then when it came across as just indirect meaning, you expect that the child will know what a chair is or what--

What wash your hands means.

--what wash your hands means, and what... why ...and things like that mean. And the reasons why it is important to point out when you give an expectation you give a reason why there's that rule and that expectation, which was really good to point out.

(Week 6) I thought it was good for a review of indirect and direct communication that can enhance self-esteem.

B. Task Environment Structure: Environment (see Appendix E)

1. Reflections of Type of Setting

(Week 1) The family day-care. Home being.
More personal. I think kids would know each other better.
Smaller groups.
More one on one.

(Week 1) It's a day-care. (A14).
She told us at the beginning that it was in a nursery school.
Okay.

(Week 2) I'm just trying to determine the difference between type of setting and physical environment.

(Week 2) * in a day-care center. Wo! Nursery school? Okay.
So they were in a nursery school.

(Week 2) I think I learned a little bit about a broader view of, there was one section about, in the type of setting, the proximity of adults and something like that. It was kind of interesting to me a little bit of a broader view of type of setting. That was a neat, a good consideration * to have is the proximity of the adults in the setting.

(Week 2) How can you tell if it was day-care or nursery school?

(Week 2) It must have been at a nursery school. It's real hard to tell which one.
It wasn't a family base school.

(Week 3) Isn't the child care center called a day-care center. The child care center is. This was at the nursery school. That's the only thing that was very confusing to me and I just touched the child care center because I thought that's what it was or day-care center.

2. Reflections of Immediate Temporal Environment

(Week 1) Time seemed the same.

(Week 1) They didn't interrupt them, they let them keep eating. They gave them enough time. They could have seconds. Yea. They seemed patient enough.

(Week 1) I agreed with most of the things that said. Yeah, I did too, they made good points. Scheduling and timing and letting them *. Interactions.

When the transitions are going to happen and interacting. I thought it was good.

(Week 1) Amount of time available. It seemed like they had plenty of time. I never heard anyone say "Hurry up." Nobody was rushed. There isn't...the children seem like they're not nervous or anything, they're comfortable in the environment. They weren't eating fast.

(Week 2) That's time schedule. How effective is the time scheduling?

(Week 2) They seem to be taking their time. Habit-wise it doesn't look *.

(Week 2) * the schedule for day-care center.

(Week 2) And prepare gradually for lunch. I like that.

(Week 2) Give them 20 minutes, that's pretty good. Yea, it's neat. 12:00 to 12:35 for the food.

(Week 2) As they arrive? Does that mean as they wake up? Yea, I think so.

3. Reflections of Immediate Physical Environment

(Week 1) Depends on how much time that you have for cleanup, if the setup has your--is close to the work area for storage let the children put things away.

(Week 1) One was in the corner...the color does not stand out to me.

No.

So imagine it's kind of beige. There were some cupboards behind them * ...the one with the cabinet, the second section?

Yeah, I think so.

Must've been right next to the kitchen.

All the snacks and stuff were set up on the counter right there.
Texture?
We had wood and then we had the walls.

(Week 1) With the kid sitting in the corner with all the sound from the other little children that were in the room * there's not really much of a separation. The children that were sitting over by the kitchen area with the cupboard that would kind of block the sound a little bit. I didn't see the floors, did you? Did we look at the floors? I don't know about that. I didn't hear music going during the conversation.

(Week 1) I know they had windows in the room even though we didn't see them. But they also had the artificial light, too. I'd have to see the one to tell. Colored-colored lights?
No colored lights.
Or dimmer switches.
O.K. I personally don't like drop ceilings. I like high ceilings 'cause you feel more open.
Roomy.

(Week 1) We just have more natural lighting then.
I see there are lots of windows in there.
Think there were any safety considerations?
Everything was safe.
I didn't see anything that was dangerous.
And the design?
So they probably had supervision. They looked like they were 3 to 5 years old.
How about design?
Clear pathways; it looked like it was pretty easy to--
Yeah. They were well-divided.
Yeah. It was accessible.

(Week 1) It's supposed to be the only thing for the first one, for changing the facilities around, in terms of safety considerations. Just rearranging things, just to make sure that it's set up so that it isn't interfering with other areas that would cause accidents, children running into each other.
Design considerations. You can always do different things with posters and different *, and colors, *. Just to spur a little more interest.

(Week 1) It's supposed to be the first one, just in general, keeping in mind the whole flow pattern that you have and your quiet areas not being interfered with by the noisy areas.
Making sure you have the quiet areas.

(Week 2) Okay, so physical environment is a subset of environment.

(Week 2) This is a really neat school. Just for my half of the year. There seems to be so much stimulus for the little kids. Age appropriate stuff.

(Week 3) This is it. It's really different physical environment.

Where is this?

This is different, lots different.

I think that's good information.

(Week 3) Design, space.

You don't think about these things you know.

Interesting.

Soft materials.

Music, creations and surface texture.

Ease of cleaning. I like that one.

I like that.

(Week 3) In terms of the design features. Are these two similar or different?

They were different definitely.

They were similar?

Let's see, I want to go back to that and read that question again.

It was more bouncing off the walls.

(Week 3) Were they similar or different in terms of the facilities.

My personal thought is they were different.

But I bet the answer is similar.

Those two rooms are exactly the same.

It's just that one room has blue walls and the other room is red.

Otherwise, the rooms are exactly the same.

Yeah, I guess it is.

(Week 3) Private spaces, touch screen. Oh, cool. That's cool.

It is, isn't it.

That's cool, the bean bag chair, the carpet.

(Week 3) Right now we're in storage.

I think of my own storage. It's a nightmare. I did some organizing in my own place. I had to, I was going crazy.

We don't have a lot of storage space. Oh, I see, they're talking about in the previous one about the stuff that's accessible to kids, right?

Yeah. The storage on them, the shelves and things. The art materials and stuff. The screen view storage that's accessible to children.

Um hum.

There. That's neat.

It's not as accessible actually as the tables.

The kids in the chairs.

They are * on the floor and crawl around on the bottoms.

Now we're on boundaries.

Yeah.

Because we did spaces. Tape on the floor.

Oh, there's a little farther one. Tape on the floor.

Yeah.

Maybe this right here? You mean this right here. This table?

Enclosed is the space.

This will be interesting. Did such a good job with that. Create boundaries. Yeah, that's good.

(Week 3) Not having things cluttered and too close together, having enough space. Not having equipment that's child life threatening. Like the blocks at the child care center. Rounded corners so that they're not going to bump themselves. Keep them from being cluttered too. Just too much junk. Did you notice any of that *.

It drove me nuts too. It was like there were things all over the place.

It looked like my basement.

It was bad.

"What are some specific ways adults can change their facilities of the physical environment in terms of design considerations?"

Low shelving. You can always make different little pathways and constructions and areas. Move the tables.

You will want to move the chairs. You can do something about too many kids being together and also for quiet time too. Move chair around without other chairs around it too.

It's not so hard to do, it just takes a little imagination sometimes, I think.

It's like when you change around your room or your house. It's the same kind of thing.

The design things too. Those little beanbags you were talking about that the kids could just huddle in. I thought that was a great idea.

Who ever dreamed that up, it was just great. I think there are some kids in day-care that don't have a chance to be alone. They cannot do things on their own. They always need to be with a group to do things.

Real institutionalized.

It is. It makes me so sad.

(Week 3) Now we're on set up *. How can you change the physical environment in terms of set up?

In terms of spaces, boundaries and supervision.

We kind of talked about that already, just as far as having boundaries set up in such a way that it creates a pathway so it's not blocked. Like if we put a boundary with blocks in one area and another, making sure the child could get from one area to the other. So the boundary would define the area, but at the same time allow a pathway to go through right into one area to

another, like art.
Or outside.
Yeah.

(Week 3) And the things were low enough so that they weren't, I mean the things were high enough so you could see them from over here, they weren't blocking your view of other activities that were going on.

And you could usually see the children. If you stood up and looked around it was very easy to see where the child you were observing had gone.

(Week 3) There could be some more details in this too. I don't know how much there is. When you say the differences in floor space coverings for instance, there are surfaces * really know what's ahead. Gravel or sand or dirt or grass outside. You know you could give examples.

(Week 3) I haven't thought about using tape as boundaries I guess, that was a new one.
Yeah, the set up part as far as boundaries and what's the other component, there was boundaries and pathways. That was interesting, I think I learned a little bit more about space in the physical environment.

(Week 3) We also talked about it today in class and that was kind of interesting too, thinking about it. Thinking about space.

You said you talked about that in class, is that similar things that were presented in class or were they different.

Some of them were similar. Like we talked about private areas and we talked about setting up.

They were categorized differently I think. It wasn't a consistency.

I think we had more detail today in class. More information, more background, more *.

(Week 4) Yes. The organization was great, as far as around the table, they were around a circular table, so they were kind of the same there, and. . .

They were similar.

(Week 6) Yeah. I thought what I learned a lot about was the physical environment. I thought those kinds of things, I didn't really think how much impact they have on the developmental child. And so that was really something I learned, and I learned--you know, for myself, I thought, wow, you know, this is important. It became a value, I guess, that wasn't there before, in my--internally.

4. Reflections of Immediate Social Environment

(Week 1) Circumstances were pretty much the same, except for less kids in the second one.

There were more kids in the first one.

* how many kids did the second one have?

Four.

The last one had five.

(Week 1) That last one just didn't seem like she liked kids very well. I mean, the way she...

She didn't.

(Week 1) I think changing the group size would change the schedule, with more kids deciding it together.

And the setting. With a larger group, you need a bigger large group area; you have a smaller group, a smaller area.

More time for transition.

Yes. Probably more time to do your activities and stuff, too.

Yeah. You would also need more area set up.

What is group culture?

I suppose the different cultures in the group, if you have children who don't speak English.

(Week 2) Structure? Like who's in charge? Probably like if the kids are going to be in the small groups or maybe larger groups or how much, you know. By group. That could be a second tie in with organization. How the groups are organized. The group could be what are they doing. I'm not sure *.

(Week 4) That's nice. * related to culture. That's good.

Really? Huh. I didn't notice that.

I like that.

(Week 4) It was small groups, wasn't it?

Established routines--were those the snack scenes? Is that what * established routines? Look at all the * eating crackers.

But in terms of social environment.

(Week 4) Are there other ways other than by observation to find out how long the group has been together? Maybe look up their birthdates, and look how long the teacher's been there, and all that. "Conversation based on shared experiences." "What are some indications of the experiences a group may have shared in the past?" All of them would be talking--

But that's conversation based on shared experiences. Based on past experiences, maybe? Like remember when we went to the park, you know, *. That's a little bit different. The activity, it would seem routine to them too.

(Week 4) Contrast the emotional tone.
Well, if you're on the negative side of friendliness, if you're putting them on a continuum, I suppose.
Oops. Just touched--
"Each of these aspects should be thought of as on a continuum."
(A126)
So they could be on a negative continuum.
Yes.

(Week 4) "Was the emotional tone similar or different?"
A lot different. The first one was just so much--
Just more active, more--yeah, less--
The kids responded to each other.
They were interacting more, and the second was more...There was more difficulty, it seemed more..., just the kids interacting.
There wasn't as much warmth between the children...
With the teacher, she was doing everything for them.
Yeah. Right.

(Week 4) This one segment where we viewed--it was like, we were asked to view--to notice the boy in the blue, white and red shirt, and notice the contrast in the role. His contrasting role, it said. And I was really honing into that, and I thought this is really cool and neat, and we honed in on it, and we noticed some differences. ...this seemed to be really important, and I thought, "This is really good that they designed this in the program and pointed it out," because I think it's really interesting to note that different role, different way the child was acting.

(Week 4) Yeah, an important thing to look at in terms of the different ways a child acts, I guess, the different roles that they have during the day.

(Week 4) Like the one--there was some series of ones about the sponge for helping out and cleaning up, and how the--what expectations the teacher had, and then there's conformity, that one scene about conforming for snow pants-- Those were really--those were really interesting, I thought. And then the norms, the one about the paint, the face, the paint. And the face, and how the one child kept wanting, insisting on cleaning her face off. That was a good one.

(Week 4) I really enjoyed the section on environment, I thought that was really interesting, and the group--the structure, leadership, roles, expectations, and how groups can really differ just in the way the teacher has expectations for that group of children. And how the emotional tone of that group can be so different, and how they--how those things interrelate too, how organization, group, emotional tone all interrelate.
And that the emotional tone is on a continuum.
Yeah. Yeah.

There were no negative characteristics pointed out, but you had explained that you are trying to stay away from negative things. But then it noted they were on a continuum. So that was kind of an interesting concept.

(Week 1) The group size is...the children and the adults. Just the environment differences is the only thing that we're really focusing in on besides the examples or just the conclusion. But as far as the environment. I thought it was fine.

C. Task Environment Structure: Central Phenomenon--Children
(see Appendix E)

1. Reflections of Developmental Principles

(Week 1) I also noticed some of the characteristics of the four-year-olds.

(Week 2) And in the intro I noticed it said you should already have a little bit of knowledge of stages or whatever. So that's good because some of the things a person coming in without that knowledge base wouldn't understand. Like adult role. So that was good to state that, too.

(Week 2) One-year-old eating with a spoon. Pick up after themselves. Yeah, or pick up after themselves. That's my husband. Not quite yet. Developmental.

2. Reflections of Individual Differences

(Week 1) The temperament is always different. Some kids will sit for anything. Some have a fit over anything.

(Week 2) That's hard. Those individual differences. That's a big one on individual differences. How a caregiver can deal with those. All their children.

(Week 4) "Who initiates the counting, who takes control of the discussion, and who picks up the counting after it has already begun?" (A128) Oh, that's the little boy in the red hair, right?

Who do you think?

Yes. Definitely. Verbal communication.

Yeah. The making of a great leader. You can just tell. He's really on the ball. (They are watching video segment A129).

D. Task Environment Structure: Activities (see Appendix E)

1. Reflections of Types

(Week 1) The second group really had no reason to talk, they weren't given any--

They weren't encouraged at all. That'll come with experience. And things to get the child involved. It was snack time.

2. Reflections of Boundaries

(Week 2) When I was over there viewing the infants, they toddled over there and got their milk. They must do it every day. The toddlers. Yeah.

(Week 3) Really? Oh, wow!
That was really something from the five-year-olds.
Were you working with five-year-olds?
I watched them at the University Child Care Center one day.

(Week 2) The second one was saying that I'm not even going to give you the opportunity because I don't believe you can do it. That's the feeling that I got from her. Where the first one allowed them to do that. Just like when we were viewing over at the day-care and it was lunch time and she let those three little toddlers go over and get the milk. I was amazed by that. To give them that kind of responsibility. And that's what the first one's doing. She's giving them responsibility. I remember we used to do that with the toddlers at lunch time. I was always afraid they were going to drop that milk carton, because it's heavy, but they were great. They did a good job.

3. Reflections of Elements

(Week 1) Well, I guess I was focusing on the interaction with the teachers and the children and also the majority of the children's responses and remarks, but I think that, I mean I could see better interaction with some teachers than others, but I don't think for myself that it was a very impacting while, or many insights at all. It was just more observation of teachers and I don't even know if it would be a good way to say that this is a good example or this is a bad example.

(Week 1) And it was very rich in action. All the kids were interacting with the teachers and with each other. Interesting.

(Week 1) Personalities of people (adults) were different.

(Week 1) I thought these children were essentially getting along pretty well.

Yeah they were. There wasn't any fights or...
It was a lot different than snacks I've observed.
They were almost too good.

(Week 1) There was subtle differences that you could pick up by watching those movies.

All three of the teachers were different.

It wasn't like one was beating the kids and the other one was

yelling at them.

Yeah, but they all have their own way of teaching. Which everyone does.

(Week 1) The kids were good during snack though. I have to admit there was no fighting or pushing or grabbing off each other's plates or spilling.

That's a big one. And they did finish, seemed to finish the *, if you give them crackers, little crackers they seem to finish.

(Week 1) She didn't interact very well. I just feel that. It was interesting. She just kind of sat there and was looking around *.

I just noticed her literally determined to get that spread on her own cracker.

(Week 1) Well, we've done a lot of observing and it's mainly that all the teachers are different in different situations and handle it different. I think we've already known that from working.

(Week 1) But in these situations you know, just snack, it kind of showed you that all three teachers handled it different and I think that was their main goal.

(Week 1) In that last scene, did that little girl spill her juice?

No.

You say no, she says yes. I put no.

'Cause she had her wipe it up.

When she handed her a napkin?

Yeah, to wipe up her juice.

No, she said "I don't have a napkin."

That was in the last one.

No, that was different.

The little girl was sitting right next to her on her lap.

There was a little girl over on the right of her that had a napkin. Anyway...

Yeah, that's...it's not that big of a deal.

Were some of them drinking milk?

Yes, in the first one they were drinking milk.

O.K. I will try to remember this.

(Week 1) I think the main thing I notice different in them is the communication. There's lots of communication going on with the older group of children.

Even among themselves they didn't say anything.

(Week 3) ...they were dipping in crackers in peanut butter or something?

Yeah, were you just dipping them in the peanut butter and not spreading them on?

Sure.
Didn't the cracker break?
No, it didn't.

(Week 4) They were talking. They were interacting.
Say in each group *.
Yeah. That's true.
I seem to remember one was not speaking as much as the other one was.

(Week 5) So to sit up in a chair you would need to know what a chair is and what "sit up" is and what--
Yeah, right.

(Week 5) Oh. O.K. You are capable of going to get the milk by yourself.
You are capable of passing food at the table.

(Week 1) Seems at first they were just doing it among themselves until someone got attention from the teacher--or praise from the teacher--and then everybody wanted to talk directly to the teacher so they could get that praise.
There was still interaction going on between the children, too, but the more she got involved the more it was directed to her. Quite a bit happened before she got involved.
They were doing it for each other and to each other.
Yeah.

Then as soon as someone got recognition from her, then they all started.

It was the one little girl in the pink who counted the girls as five girls, because she didn't count herself.

Remember when that issue went around, "Well, I didn't count myself," you know, or "I counted myself," so she's probably getting into that stage.

(Week 1) That, and then the last gal didn't do much of anything with the children.

That first group, they were talking about the kids who were sick. And they go over counting everybody in the room, and who's there.

(Week 1) The child got the beverage.

What's that?

The child got the beverage here.

The other one she brought it and got it herself. The middle one, she had the juice right on the table in front of her.

(Week 2) I think in the second one it seemed to me that the teacher was kind of rushing them a little bit. She kind of was passing the crackers around. She seemed to be more so then, a little less relaxed. * manipulative.

(Week 3) Busy counting.

Yeah. They're good at that.

They can learn while they're sitting there at snack time. That's great.

(Week 4) They were kind of reaching.

One group was sort of spread out.

It seemed like everything was by the teacher. Like the cream cheese and the juice and the crackers were here, and there she was, but then in the other group it was kind of like there was a bowl here, and a bowl there, and the juice was around, and kind of passing it around, and "Please pass the milk," and it gets passed, pour the milk.

II. Reflections of Judgment Processes in Student Responses Regarding Instructional Material

A. Judgments of Fact (see p. 26)

(Week 1) I think part of it was they didn't know how to put the cream cheese on.

They probably didn't know what it was. They never explained it and they probably never had cream cheese before.

(Week 1) I like that * cream cheese. They're expected to know what to do with it.

Yeah.

I don't think they did.

She was kind of *.

(Week 1) I don't think she understood the children's needs. The second one?

*. Totally unreal to me. *. She didn't do anything but tell them not to put the sticks in their mouth.

They needed to know how to follow the rule about the sticks.

They have the capacity to follow rules but they didn't follow the rules.

They didn't know what the expectation was.

She assumed they knew what cream cheese was.

(Week 1) They also, I think, morning snack's different than afternoon snacks. In the way they act and how they feel.

When they're usually grabbing someone else's or pushing.

I think in the afternoon they just *. They just want to run around. They'd rather be outside.

Or tired.

They just wake up from their nap and a lot of times they're crabby. But those days seem to get along pretty well with a morning snack.

I think with a morning snack they are ready for a break. You know.

They're usually hungry too.

Yeah.

(Week 1) The one though, not telling them what that cream cheese was. A lot of them probably had no idea what it was.

(Week 1) But then she ate it. You had to kind of laugh, because I could feel that from her attitude, she was really dying for that cracker. And she probably needed it.

(Week 1) First lady seemed really happy to be there, and the kids were happy, because she was in conversation, and secondly, they didn't care. She was just comfortable with the surroundings, and that flowed through to the group. And that, I'm sure, had to do with being familiar with the children, and comfortable with what your role is and what your role is like; it's really important.

(Week 1) And I didn't see a lot of addressing the children by names in the second group, maybe because she doesn't know all of the children's names.

(Week 1) To a small child a drop ceiling is a little high.

(Week 1) The teachers weren't rushing them or rushing themselves either, because that affects the kids, too.

(Week 1) Oh, the length of time that the second group, the gal probably didn't spend enough time with them to know the children to get them involved in conversations with each other. We hope. Maybe, she's just like that. That happens, too.

(Week 1) That gal was pretty new, too, because she didn't know where the other places were to hang the coats. But she asked about it.

(Week 1) Same with if you have a bunch of leaders, it's going to take a different amount of time, than if you have a bunch of followers. Because they need more time to express themselves, and that all their ideas are good ideas, and to encourage them to develop in their leadership roles.

(Week 1) I think it's important to instill that into the students, that everything you do has an impact on the children, because you are part of that environment. And you can see that in the videotapes, too, how you influence the environment. It's good to see that.

(Week 1) I noticed in there, there was a little boy who wouldn't go with the crowd and one of the teachers had put a chair and told him to sit in this, and he didn't, and eventually the

children had snack. But you don't know the situation that was behind it. But things like that. And then how it affects you emotionally and the child emotionally. They don't retain the memory of this stuff for very long. Where we will remember that forever. And to remember to throw that out and start over again.

(Week 1) But you can see the gal who's introverted is probably really narrow in focus. Ultra-narrow right now, but she'll develop as she grows, hopefully.

(Week 3) If you think about that outdoor play area. The kids really could enjoy being there, really well. They could see what was happening and just go to where they needed to be.

(Week 4) "Do you think the emotional tone was different because of the teacher's role."

Right.

And probably with some of the kids, too. Could have been slower. They might have been tired.

Remember the one kid in the group who was kind of a whiner? The little girl who didn't use her words a lot, she..."I want some cracker."

You know that's kind of hard.

She was--I saw her in another scene, too, where she had that whining behavior. That usually--that can really be hard on a teacher. I had a kid in a group that was like that and you can't--you've got to be real caring and affectionate, but it's hard, because you have to really spend a lot of extra time, and it can really color the tone of the whole group.

(Week 4) God, yes. Well, and if it was the same day, he looked scared earlier, if it was the same day.

And withdrawn.

Maybe there's something wrong in the family.

That's right.

And that monster's just a symbol.

And the other kids might be...

Yes. Oh, that's true. She didn't know that.

(Week 4) I think children--the reality of it is children will explore those aspects. Some children will. And some emotional tones of groups are very negative, you know. It's important for people who are learning about children to realize that. So that they can deal with that.

Right. The kids have those days, just like we do.

Right.

Like as I'm having today, as a matter of fact.

Yeah.

B. Judgments of Compatibility (see p. 26)

(Week 1) Maybe she could have had them just try a little bit. Either that or you get second stick.

(Week 1) With some sticks * put them in their mouth. Yeah. She never said what they were. She should have let them try it.

(Week 1) She should've had them put it in their mouth. You know a stick isn't a knife. She should've put a little on each one and let them try it. Or should have taken the time and show them how she was spreading it.

(Week 1) I kept wondering if she was doing that for a child. I thought that's what she should have done is showed them. First taken the time to show them how to spread the cream cheese on the cracker.

(Week 1) Yeah, watching that second example, that lady just sitting there. She wasn't involved with the kids at all. I know from watching that I would make sure I don't do that. It would be a long day, and some people shouldn't be in the field, but you can develop this rapport with the kids, too, and a lot of it's just being comfortable with being with kids.

(Week 1) The one with the little boy that kept talking was driving me crazy. She was too nice or something, I don't know. It just seemed phony. But then again, she might have been a little self-conscious about a camera being in there too. Sometimes people act real unnatural. The first one just acted real natural.

(Week 1) There's so much that we have still to learn. Our experience is so limited right now. To see those things on the video would be really helpful to give us--O.K., I like that method, I'll have to try that, or I do that and that's not a good method. Because you can see different examples so you can weigh out the pros and cons. The method that may not quite be appropriate may still work, but with the repercussions that can come from it, and the repercussions * the child that may redirect * and start throwing a temper tantrum just because of how you handle a situation. Just different things that help us evaluate what can we do in a situation.

(Week 1) It helps you also with your judgment calls. When you go into centers to observe, O.K. This fits over here and is appropriate and this is inappropriate, so you can distinguish what is good and what could be improved on.

(Week 1) Yeah. One of my placements was like that. There was some storage and play areas was built up right in the middle, so

you had a square--
Walked around it.

--around a square. So you always had to either have the back area closed off or the front area closed off, or have enough personnel to view all four sides, which would take at least three teachers. And they had that, so it was fine. It was a lot of fun, too. I really enjoyed it, because it also blocked out the sun, which was nice, to have one area do that.

(Week 1) At the center I'm at now isn't it home day-care? The kids know that when the hands are on the twelve and the nine, it's time to pick up. And they watch that clock and if she's late, they'll run in and tell her. "Hey, it's on the twelve and the nine, it's time to pick up." There's one little girl who has to eat early and she knows it has to be on the eleven and the three, so she gets her own lunch and goes and eats. Crystal never has to tell her.

That's nice. Teaching the children to be independent. Even if they don't know the time, if they know the placement of the hands, that we do this at that placement.

(Week 1) Well, changing the time schedule wouldn't change the way the room is set up.

Not necessarily, no.

It could change the emotional tone, though.

Yeah. They'd be confused. Where I am right now, there is some format to follow, but things have changed all the time.

Too much flexibility.

Yes. I can't settle in--I don't know where I'm going half the time, these things get changed so much.

(Week 3) There's one area where they could have those kind of under, they could hide and climb around. You know that one area. That loft?

That little house area, which was good. I think they need to have a little place again, even outside, a place where they can kind of pretend maybe by themselves or whatever.

(Week 4) Maybe you could bring up social interaction if you got a big tub of * and everyone has to share. But I think there's ways it could have been more available somehow. I think... The kids could have been closer.

(Week 4) But they both seemed interested in making sure the kids had enough to eat, and things like that. Their physical needs are being met, and not saying, "Oh, you can't have any crackers." And the choice, of taking the cream cheese, stuff like that. Although *. It seemed like they needed to have a snack on a plate or something, instead of using these big cumbersome containers.

Which is hard to handle, even for an adult.

Yeah, it is. Somehow, having their own little container, maybe.

(Week 5) --they don't give a reason.
--they don't ever explain why. Just say, "Take one cookie at a time," and that's all.
Really. That's all they say. They don't--they cut it off there.
Yeah.

And I think--you know, the thing that's funny about that is adults will say, will explain, they'll kind of say, "No need to explain, I understand," and with children, I think what happens to people a lot they treat little children the way they treat adults. They have--but children don't know, they're learning. Right, adults know a lot. They know why they should do this. But children don't.

That's a good point. Being used to adult communication for teaching.

(Week 5) And that sort of stimulated my thinking about how adults communicate with children and we sometimes, I think, communicate with children the way we communicate with adults. To get them to give a reason, they just assume the child will know, but the child doesn't know, they're learning, that's why they're children. So that was real neat to think about. It kind of tied in to what we were talking about in class today.

C. Judgments of Priority (see p. 27)

(Week 1) Yeah, if they were rushed, then they wouldn't have the time to interact the way that they did among themselves without the adult coming and interjecting.

(Week 1) Holding it against the child.
Yeah. You can't. You can't operate that way. I've seen that, different techniques that can be used to focus on a behavior but not on the child, to separate it. I don't like that behavior but I like you. So that you can be building that child while you're trying to redirect them.

(Week 4) I remember this one day-care center I worked in, there was this huge open area, the lunch area was very, very open. The kids to toddlers could sit in the cubbies, and they could see everything around them, and it wasn't--there wasn't, like kind of like blocks and games with little countries and areas and things, and when they had lunch, it was like Camp Chaos, because the kids were going to go to their cubbies. I felt like there wasn't, I felt just like the boundaries *, because there weren't boundaries to it, to define some of the areas. And I'm just thinking about it now, but at the time I didn't. I just thought like something was wrong, I was affected by the environment. And so in turn, that affected the kids.

Was it real noisy?

It was very noisy and the kids, the groups of preschoolers going

into the outer room, passing the toddlers, and the toddlers going "Who's that?".

Yeah.

And everyone having to deal with that and having like...right by the kitchen, the table would be right by the big kitchen, right by--it just was not--

No conversations.

It was just trying to get the kids to sit down, and then they get up, and move around, and want to go read a story, and they didn't want to eat lunch. Sometimes it was real hard to get them to sit down. This is jello, and this is--

And you're motormouthing your way through some days.

Exactly. I'm like--by the end, I'm dripping with sweat and exhausted. And there were topics too, so they're hard anyway. Just thinking about that physical environment, it's--not very comfortable.

Yes.

Also, too, if you might accommodate more time for small group, you might see more interacting, more language development, rather than if you have it really a lot more spacious, you see more... move around more, more activity, more physical activity--

--yeah, that was the whole idea, that physical environment at the Center was not organized, and there wasn't real rhyme or reason--to me, anyway--of what, why--you know, certain areas were--it wasn't very clear. I mean, just--and I wasn't comfortable with it, so I think the kids could pick that up, and sense that. And it was just kind of like here's some stuff for you to play with. Have fun for eight hours.

Yeah. And it's like, I'm thinking about it now, much more than I did several years ago. But it's just amazing now to think about how that could have influenced the way that the teachers were teaching and the school, it was hard. Those kids, they were not--real all over the place.

Yeah. Because the program was...

Otherwise, it was--yes. And the director, when she'd come out and try to interact with them, she'd just...she couldn't--she would just not have any luck at all. She'd just--I was the *, I was the fix-everything kind of person, and so she'd say *. She'd just be...The kids would climb on tables. I left because it was so bad, because it was just--the kids were not learning. The only times they really learned was when they had time to give * because then it was kind of--there was no structure. Besides that, it was just--I could see what was going on.

That was too many groups to have.

Yeah, it is.

--nothing happened. Well.

D. Judgments of Consequence (see p. 27)

(Week 1) I think I would have let them battle it out verbally, themselves, so that she would learn to use words and the other

one could learn to listen to words rather than allowing for adult intervention all the time; then they rely on that.

(Week 1) Yeah. That's really important. Because you find when you cut down on that (quiet areas), you have a lot more chaos. Having definite boundaries between the areas. Shelves or cubbies or--

If you don't, there's so much room to run.

Oh, yeah. They'll find clear a pathway to run, they'll be a lot of * kids. Supervision considerations. I suppose just not having tall things in the middle unless you have personnel to be staked out so that you can view--
See everything.

(Week 4) That would be also for the other scene for snack with the older teacher, with the smaller group, where they're talking about the sort of stuff she...* and about her way of kind of listening, and inviting them to elaborate.

Not much though, the monsters thing got cut off.

She did do that, I noticed that.

It was like she encouraged the positive things, but if you brought in monsters...she didn't allow them to explore it at all and I think it's really important for children to do that.

Yeah, I thought the same thing.

(Week 4) Well, on the first one, the teacher was encouraging everyone, and giving affirmation for what they were doing "saying you're doing a really good job." And asking what the red-headed boy was doing. She said, "What are you doing, Elliot?" And then he hadn't been really interacting, and then he went "Oh! There are 18 people!" and he needed that little extra push to get him talking again.

That's interesting. She brought him in again.

Yes. Actually it's good...*...like you said, just allowing them...not taking so much control and saying "Who would like to get the chips?" Be a monster if you want to.

I think the kids weren't talking too much. (Talking about monster video). They weren't interacting with each other too much.

No.

Even though it was a real small group of kids. They really weren't. They were speaking to the teacher. So that was really important.

And they were similar, I think, in that everyone was part, or seemed to keep--it seemed like in the second one she wanted to keep things going, and not just kind of relate back and forth and let things happen like in the first one. Just let things happen, let things go, let the children just relax and eat, instead it was kind of "Let's go around and get the cream cheese on, and get the juice out, and get it all done," you know, rather than just enjoying and relishing every little moment.

It makes you wonder what would happen without the camera being

there. Doesn't it? I mean, I wonder if that made a difference in how the adults acted.

I think she seemed nervous and wasn't herself too much. She didn't say too much.

I think so, too.

(Week 4) "Would changing the group size have an influence on the time schedule or the set up of the room?" Definitely, we kind of talked about that. "Would changing the group culture change the time schedule?" Group culture? *

That's in social environment, isn't it? That was in social environment. Group culture is...

It was that roles and leadership, and stuff like that. Yeah, I think it was that. But I don't know if you'd really change that as much as it's...

Oh, but the teacher and their expectations, so if you allow them more--like that example of the teacher giving more control on the snack time.

So these--this is speaking *.

Yeah. Right. Exactly. Norms and expectations. You know, allowing the toddlers to go get milk.

Oh, certainly.

I thought how can they go get it because their kitchen..., but they've done this before, so it's O.K. It's amazing when you've...they know exactly where it is, almost like calling *

Yeah, *.

They got to do something.

Yeah. They felt good about themselves, they accomplished that, and they had purpose, so it was like now we have a focus here, so we're not going to be off...we're going over here. And the other kids were like, it was like that was providing a focus for the other kids, even though they weren't doing it. It provided a focus for them, too.

They had to watch.

Yeah.

To see when their day came to do it, that they would do it right. Right. Exactly.

III. Metacognition--Self-focused Observations (see p. 28)

(Week 1) Things like that. How detailed do you need to be? Then detail is so important in the overall environment. Once you're in there, then you go and check things out, but it teaches you, too, that I need to be aware of everything that's going on, not just cleaning up this table and watching these children right here, and supervising. It's getting not so focused on the small area but having a big picture of the full area. And I'm working on that, myself. I still don't have a full picture of what's going on in the whole environment, rather than getting narrowed down, because I tend to do that myself. But I've just learned that about myself recently.

(Week 1) Right, right. I kind of feel like I had an advantage because I saw these tapes, you know a lot of them before, and I know how to pick out all the little details and stuff so I feel like I have a bit of an advantage. Someone who's seeing it for the first time wouldn't have realized that maybe they weren't drinking the same thing or that the teacher didn't knock that cup over.

(Week 1) I think if you were new in the program and you hadn't had any experience with teaching and working you would learn a little more then. See, I also work after school and have been doing student teaching all year. But there's always something to learn.

(Week 1) Because if you wanted to see what happened before the snack you could see that too.
I like that they did that. Showed you what they were doing before. That was important.
That is a learning tool right there. A lot of those things you don't just automatically know.

(Week 1) Expectations and rules needs work for us. It's good to point out areas for myself that...areas that I need to be more aware of and to work on, so I guess flaws in my learning, and some places where I need to develop and do more studying, and just experience it also, and their observational skills, and what to do. But it's just there's so much to learn, it just makes you more aware of that, but there's a long way to go. And that we're all underpaid for the amount of knowledge that you need to have. It's the most valuable resource that we're working with, in the world is the children, and it's so important, so it's satisfying to know that it's good to have the education behind you so that you can work with what we have to develop and the parents while they are at work. I'd be satisfied with seeing results rather than a paycheck, but it's rewarding when we can see all the things mapped out that we need to know, all the things, it's amazing that we have so much information in our minds, and we see it mapped out. It's kind of awesome. And we're just scratching the surface.

By watching the videos I learned more about myself, like "Oh, I do that, yeah, that really works." It was kind of--

(Week 2) I guess for the questions, I think that came about similarities and differences that got me thinking about the scenes. I wasn't thinking about that as I was watching, but then the questions came up and then it got me thinking about comparing *. As it said "answer these questions" *.

(Week 3) I liked the little diagrams of "this is an example of a... private space, this is an example of a..." That was kind of interesting. That kind of actually helped me imbed the concept

better than just the words of private space is... That's good. I liked that and it creates interest.

(Week 3) It made me think about, I guess in my mind it gave me a visual picture of how I was thinking of an area and then sort of thinking about these concepts and trying to apply them to this idea in my mind. This picture of a day-care center and trying to kind of integrate all these different things, the set up and facilities and how they would work.

(Week 4) Actually, I would have liked to see a little scale, like friendliness over to hostility or something. For my own-- To visualize.

--it's important for me to be able to see all aspects of--to see that continuum, not just to say--well, it is a continuum of friendliness, or is it a continuum of friendliness to hostility, or to what? You know, that, I think, needs to be explored.

(Week 5) It was just honed in on that one aspect, the expectations and rules. I'm a person who likes the whole, I'm not as good with components, I like to see the whole and how they all interact and how they relate, so I think going component by component sometimes is hard for me to get the whole, but the last week we did it it seemed it was neat because you could see the interaction of the components. I got the picture of the whole, and it made sense.

(Week 5) And these questions do stimulate thought, but I think it should be in a very introductory course. I don't know how, I mean, I've learned all these things before, I better have learned these things. And I noticed in the videos that you know, I was thinking to myself, people that are hired and have education, you don't stop to think, "How's the best way to say this?" It has to be the--what's the word?--it has to be so inward--intrinsic, that it's just second nature, you know. And that's where some people are, after education you have training. But this is, I would think, like some of the statements, between direction and reasoning and how to state things with children, is good, you know. It's very useful, yet at this level, I hope that they've gotten some of this in other courses. So I don't know how much--until I saw the whole thing, how much higher cognitive thinking this involved.

IV. Overall General Comments

(Week 1) I think it would also help instructors, too, for planning, so they can have their focuses on the areas that are here. Because it covers all the areas that you need. But they could have a list of references for you to go and check out yourself, too, for additional help if you don't have a natural understanding of that area. Because a lot of it is somewhat

instinctive, and you don't know the whys behind it, so it helps to bring out the whip and things.

(Week 2) I just think it's a real good... The scenes were good comparison kinds of scenes for what I think is going to be the whole of this.

(Week 2) It's a lot of information given to you and it's, it was hard sometimes too, especially that one part about, was it the rules, the need and the opportunity, the rules and expectation part? The need and the opportunity, caregiver's assumptions. Yea, that was kinda...I didn't quite understand how all those pieces of the screen fit together, it was sort of confusing to me. I mean I understood each little segment but it was sort of I guess sort of abstract *.

(Week 2) Well, I'll start. I thought the first part of reviewing the snack was a waste of time, the other part was good, or I mean, there was more to gain from it. I guess I didn't see how a person, with some of the questions, could give an answer from the review.

(Week 4) That was real neat to explore those different things, I think. I like that. I think it's really good to integrate concepts, and I think that those components of interrelating what each little individual component, it's really important to do that. Because I think it makes--it's kind of, it's that higher level of thinking, analysis, you know. Yeah.

(Week 3) (Physical environment.) I didn't like this as well this time as well as I did the first time. It seemed like there was too much and it was too choppy and there wasn't enough detail.

Or transitions from one idea to the next or something like that. Or like how they relate and how they...

Well, that's what the goal part is supposed to do. I guess I didn't get that.

(Week 6) I think for the way that we have done it, I think that I really haven't learned anything new in child development. I think it reinforced some things that had been talking about, and what we had been going through in class. I don't think I really have learned anything new about myself that stands out.

(Week 1) I love the format. Although I think some of the introductory vocabulary, depending on the population you're looking at, might be much too sophisticated. And I also think you could use humor. Because I know that really grabs my children and I do remember doing an interesting thing, personality profile or something. That had a similar format. And it was more fun to use, just because of the way it was worded. And some exclamation marks or some questions; "Would you

like to learn about young children, bla, bla, bla," or "What are your interests?" or something maybe like that in parenthesis. Lighten it up, lighten it up, dig it out of the Ivory Towers.